USE OF THE BECK DEPRESSION INVENTORY IN NORTHERN BRAZIL

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The Beck Depression Inventory (BDI) is a popular screening and research instrument for measuring severity of depression. The instrument was translated to Portuguese for use in Brazil in 1979; however, it was not until recently that its psychometric properties have been tested empirically for the Brazilian population. The purpose of the present study was to explore the BDI's psychometric properties in a northern region of Brazil and to test for possible relationships between certain demographic variables and BDI outcomes. Samples used in this study were from an urban area in Roraima, the northernmost state of Brazil.

The BDI showed adequate levels of internal consistency in nonclinical and clinical samples. Female respondents had significantly higher scores than male respondents. Those who had lower levels of education, income, or occupational status had significantly higher scores than those with higher levels of these variables. Adolescents had significantly higher scores than adults from all age groups except those from age 19 to 22. No significant difference was found between those who identified themselves as "indigenous" and those who identified themselves as "non-indigenous." Regression analysis results showed that the combination of gender, education, and age best accounted for the variance in BDI scores. An ANCOVA revealed that clinically depressed adults had significantly higher BDI scores than nonclinically depressed adults.

Factor analysis results showed that there were two main factors in the item structure for both female respondents and male and female respondents combined: one factor of mainly cognitive-affective items and the other factor of mainly somatic items. The results were discussed in terms of the future use of the BDI in Brazil.

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CHAPTER I

INTRODUCTION AND BACKGROUND

Depression in Brazil

Like other developing nations, there appears to be a growing need in Brazil for effective screening measures to detect depression, as well as for instruments to aid in treatment planning and evaluation. A recent epidemiological study of psychiatric morbidity in São Paulo, Brasília, and Porto Alegre had found that overall lifetime prevalences of psychiatric symptoms were unexpectedly high in these Brazilian urban areas. Prevalence rates for depression showed some variation across regions, from 10% in Porto Alegre to 3% in São Paulo. Closer examination of the results found that women experienced depressive disorders twice as much as men. The fact that prevalence rates were higher in this survey than previous ones prompted the authors to suggest that mental health status in Brazil may be worsening (Almeida-Filho et al., 1997). Adolescent rates of depression in other surveys in Brazil were 28% in a psychiatric unit (Silva-Riesco, 1985 as cited in Garcia-Alvarez, 1986) and 11% in a community sample (Feijó, Saueressig, Salazar, & Chaves, 1997).

Unfortunately, there remains a paucity of standardized and validated instruments for assessing depression in Brazil. It is ironic that, although the field of psychology in Brazil has traditionally been oriented towards applications rather than basic research (Nunes, 1993), there has been a scarcity of research funds and resources to do clinical

research, and thus, to develop and use validated assessment tools (Angelini & Agatti, 1987).

In recent years, however, there has been a growing interest in Brazil to use psychometrically sound instruments for evaluating depression and conducting research. This interest has led to the translation and adaptation of research measures such as the Self-Concept Scale (Villar, Michael, & Gribbons, 1995) and the Self-Consciousness Scale (Teixeira & Gomes, 1995), and clinical measures such as the Psychiatric Screening Questionnaire (Mari & Williams, 1986), the Hamilton Depression Inventory (Ramos de Carvalho, Lima, Azevedo, & Caetano, 1993) and the Montgomery-Åsberg Depression Rating Scale (Dratcu, Da Costa Ribeiro, & Calil, 1987). Most of these measures, however, remain unvalidated in Brazil and continue to lack comprehensive norms. One self-rating instrument that has been receiving special attention in the Brazilian literature and has been enjoying increased clinical use in Brazil is the Beck Depression Inventory (BDI).

The present study was conducted to contribute to the growing work in assessing the BDI for clinical use in Brazil. The presentation of this study begins with a general explanation of the process of evaluating instruments that purport to measure depression, followed by a review of the literature on cross-cultural psychological assessment, assessment of depression, and research with the BDI. After this, the study rationale, objectives, and hypotheses are presented. A description of the procedure used to carry out the study is then given along with a presentation of the research results. Finally, results and implications of the study are discussed in the concluding section.

The Measurement of Depression

The assessment of depression using psychometric instruments can be an important part of the process of diagnosis, intervention planning, and the evaluation of treatment. Using such measures can be a relatively efficient, low cost, and objective way for evaluating depression, and can also be a valuable complement to the more comprehensive psychiatric interview (Rudd & Rajab, 1995). However, their use is limited to each instrument's reliability and validity. Therefore, it is essential that each instrument be tested for its psychometric properties so that adequate reliability and validity are confirmed.

Reliability of a measure is the extent to which the instrument is free of measurement error. Two common sources of error tested when assessing the properties of an instrument include time and inconsistency among the items that make up the measure. The test-retest method is a way of assessing the impact of time on a measure by examining the correlation between test results from administration at one time with results from administration at a later time. The consistency of items can be tested using a myriad of methods (Kaplan & Saccuzzo, 1993). For depression instruments, one of the most common is the calculation of Cronbach's alpha.

Validity is the degree to which an instrument measures the construct that it is purported to measure. There are several types of validity, but the most common for the evaluation of depression measures will be described using information provided by Kaplan and Saccuzzo (1993). Construct validity refers to the theoretical aspects of what the instrument measures. It is often tested by demonstrating the relationship between the

instrument and other measures. When it correlates well with instruments believed to measure the same construct, it is said to have high convergent validity. When it correlates less with an instrument that is not expected to measure that same construct, it is said to have high divergent validity. An example of high construct validity for a measure of depression would be an instrument that correlates highly with another depression measure, and correlates significantly less with an anxiety measure. Criterion validity refers to how well an instrument corresponds to an accurate measure of interest. For clinical instruments that purport to measure depression, like the BDI, evidence of criterion validity may include showing that the measure can differentiate those who are diagnosed with clinical depression from those who are not.

Another important aspect of assessing psychometric properties is to test the instrument's generalizability to other situations and populations. The fact that a scale's reliability and validity are confirmed in one population does not necessarily mean that the same properties will be exhibited in another. It is important to collect new data in the population of interest in order to test if the assessment qualities will generalize (Kaplan & Saccuzzo, 1993). In the area of cross-cultural psychology, this point becomes especially crucial. Even in two regions where the same language is spoken, it may be important to assess an instrument's properties in both populations (Bonicatto, Dew, & Soria, 1998).

Another important part of the validation process is the assessment of the relationship between demographic variables and the construct to be measured. Often it is necessary to assess differences across certain demographic variables for a full understanding of the construct to be measured in a general population (Blumenthal,

1975). From a cross-cultural perspective, doing so can prevent researchers from making erroneous assumptions regarding the relationship between given variables and depression (Culbertson, 1997).

Psychological Assessment Across Cultures

Cross-cultural psychological research has been seen as an important part of the process of furthering our understanding of psychological processes, providing a context by which to test theories of both universal concepts and cultural biases. As part of this research, psychological instruments need to be available that are both reliable and valid for the particular cultures in which they are used. The development of culturally valid instruments is also important in that the instrument can provide a cultural group with a useful tool for epidemiology, diagnosis, and treatment planning and evaluation.

The issue of validity in applying psychological instruments from one culture to another has been a long debated one among researchers both in psychology and anthropology. Most concerns have centered on the quality of translation, comparability of constructs, and various biases involving item content, format, and administrative procedures (Cortada de Kohan, 1972).

Translation of materials for culturally distinct groups is often a complex process and some have questioned the possibility of obtaining an accurate translation between certain groups. One of the most utilized methods for translating psychological instruments to different languages is the back-translation approach (Simonsen and Mortensen, 1990). The translators produce a principal translation. This is then checked for accuracy by having one or more independent translators translate this version back to

the original language. The original is then compared to the back-translated version to check for discrepancies.

Brislin (1970) argued that the back-translation technique can be quite effective in producing accurate translations and, in fact, he himself had shown good results using the method. However, Simonsen and Mortensen (1990) suggested that apparent equivalence using this procedure may be misleading in some cases. Even though the method seems to have foolproof checks for inaccuracies, it is often limited by the homogeneity among translators. One potential pitfall is that translators may be familiar with certain subcultures of a population and assume that the translation will be adequate for all groups. Regional differences in language may also pose a problem for the generalizability of a translated instrument (Sechrest, Fay, & Zaidi, 1972).

Beyond linguistic translation, however, is the issue of translatability of the constructs that psychological instruments are supposed to measure. In other words, how do we know that a construct measured in one culture will even exist in another culture? According to Cortada de Kohan (1972), linguists generally agree that any given concept can be expressed verbally in any given culture. However, some studies seem to refute this notion. For example, in explaining differences on certain items of a mental health status survey between Hmong refugee and general population adolescents, it was argued that the Hmong have no way of attributing "good qualities" about themselves, as this would be a form of arrogance (Dunnigan, McNall, & Mortimer, 1993). Thus, the concept of "self-worth" may not exist in the traditional Hmong culture, or at least may elude verbal expression.

Another potential problem in the development of cross-cultural instruments is bias in the format of testing. It has often been argued that different levels of familiarity with particular test formats between two cultural groups can explain some differences in performance on mental ability tests across cultural groups (Ardila, 1995). Although less frequently emphasized in the literature, personality tests and mood measures are not immune to this bias. In adapting a self-report measure on depression for use with a Hmong population, Mouanoutoua, Brown, Cappelletty, and Levine (1991) decided to change the response format from severity levels ("not intense" to "very intense") to frequency levels after pre-testing showed that many subjects became frustrated with the subtle severity distinctions. Hayes and Baker (1998) observed response bias as a function of language in a patient survey of medical care satisfaction. Spanish-speaking patients were more likely than their English-speaking counterparts to respond "yes" to items on the measure, and this response set was speculated to have led to lower reliability and validity values for the Spanish version compared with the English version. The authors suggested that the response format should exclude the "yes"/"no" options in order to deter such culture-specific responding.

Awareness of cultural-sensitivity to language nuances, test formats, and other characteristics of psychological assessment is important in developing valid instruments for use in other countries. Often these characteristics will be difficult to detect through preliminary inspection; therefore, it is necessary that such tests be comprehensively validated within the cultural context of interest.

Cross-Cultural Assessment of Depression

Overview

One area that has received increased attention in cross-cultural psychology is the assessment of depression. It is estimated that over 100 million people worldwide suffer from depressive disorders (Sartorius, 1979). Such a statistic emphasizes the need for the development of appropriate assessment tools to be used worldwide for effective diagnosis and to aid in treatment planning and evaluation. Research will also be important for improving the understanding of depression by investigating the generalizability and specifics of its etiology and expression (Marsella, Sartorius, Jablensky, & Fenton, 1985).

Finding the most appropriate tools for measuring depression in various cultures has been an area of dispute (Sartorius, 1986). Some researchers argue that the concept of depression, as is used and assessed in developed Western countries, has an ethnocentric bias (see review by Marsella et al. 1985). In some cultures, it may be most appropriate to develop an entirely new instrument from within that culture's context. However, there are significant disadvantages to this approach. First, developing new instruments takes significantly more time and money than adapting one already developed in another culture. Second, new tests are without the extensive background of research that previously established tests have, depriving them of potentially important information for use and continued development. Third, constructing an assessment tool to be culture-specific may prohibit its ability to be used for cross-cultural purposes and comparative study (Sechrest et al. 1972). For these reasons, and perhaps others, cross-cultural researchers who assess depression most often adopt tools already developed and

validated in the U.S. or Britain, countries that have the longest history and the most resources for developing such tools.

However, to apply instruments originally constructed in the U.S. to measure depression in another culture, it must be confirmed that the concept of depression is the same across these cultures. Beiser (1985) specifically examined the meaning of depression across three very distinct cultural groups: traditional Africans, urban North Americans, and Southeast Asian refugees, using an interview schedule that was specially adapted for each culture. It was concluded that although there were a few differences (e.g. the African group members who were depressed did not report a higher frequency of "loneliness" as depressed members in the other two groups), the general concept of depression remained the same.

Much of the difficulty in interpreting cross-cultural assessment results in depression does not stem from distinct concepts of what depression is, but rather, from the different ways of expressing depressive symptomatology. For example, in a review by Weiss and Kleinman (1988) it was concluded that, unlike those from non-Western cultures, patients from Western cultures generally report "guilt" and "self-reproach" as symptoms of depression. There is also evidence that somatic complaints may play a larger role in depression for some Latin American and Asian cultures compared to cultures of European heritage (Bonicatto et al. 1998; Kleinman, 1982).

Despite cultural differences in certain aspects of depression, the development and adaptation of measures for depression across cultures is becoming increasingly popular and successful. A notable example of this progress was an epidemiological study carried

out by the World Health Organization (WHO) in five different cultures: Basel, Switzerland; Montreal, Canada; Nagasaki and Tokyo, Japan; and Tehran, Iran. It was found that the instruments developed were valid and reliable for epidemiological use in all the cultures (Sartorius, 1993). One result of this research, however, was the recognition that various demographics need to be examined to determine their role in interpreting depression rates cross-culturally. Thus, it can be added that examination of the relationship between certain demographic variables and depression is vital for developing valid assessment tools for different cultures. The following is a review of research findings regarding potentially relevant demographics (i.e. age, gender, education, socioeconomic status, and ethnicity) for understanding depression within a cross-cultural context.

Age

The effects of age on depression appear to be, at least partly, a function of culture. It has been reported that in the U.S., rates of diagnosed depression are lowest after age 65, and highest between ages 25 and 44 (APA, 1994). However, in a comprehensive study using a self-report measure on adults in Argentina, the highest levels of depression were found after age 60, whereas at other age brackets no differences were found (Bonicatto et al. 1998). American studies using self-report measures have consistently found that adolescents report more depressive symptoms than adults (see review by Beck, Steer, & Garbin, 1988). By contrast, in a Hmong refugee population, it has been found that younger individuals reported less depression than older individuals (Mouanoutoua et al. 1991).

Gender

The research on sex differences in depression has been quite extensive, perhaps because the difference has been so apparent within most clinical settings. Epidemiological studies in the past 30 years suggest that worldwide, women have experienced depression about twice as frequently as men (Culbertson, 1997). However, gender differences have been found to vary depending on the nation studied. In her review of the literature, Nolen-Hoeksema (1990) reported that the 2:1 female to male ratio seemed to be unique to developed nations, and that no such gender difference was observed in studies of developing nations. However, the developing nations studied were limited to Africa and the Middle East, and the assessment methods used were of questionable validity. In a review by Weissman, Bland, Joyce, and Newman (1993), it was observed that although there appear to be higher rates of major depression among women worldwide, the sex ratio appears to be equal for bipolar depression.

Education

Studies have consistently shown an inverse relationship between education level and depression severity. Higher levels of education were associated with lower levels of depression in samples of chronic pain patients (Averill, Novy, Nelson, & Berry, 1996), married couples (Ross & Huber, 1985), and Mormon women (Spendlove, West, & Stanish, 1984). Mothers' education level was also predictive of levels of depression in African American college students (Reed, McLeod, Randall, & Walker, 1996). In cross-cultural studies, a similar inverse relationship between education and depression was found in samples of Chinese elderly (Zhang, Yu, Yuan, Tong, Yang, & Foreman, 1997),

Israeli adults (Dohrenwend et al., 1992), and Hmong living in the U.S. (Mouanoutoua et al. 1991). Most studies continued to find an effect for education even after controlling for other factors. The robust relationship between education and depression is not surprising. Education fosters an increase in knowledge, skills, and information that can aid in developing more effective coping techniques in times of stress. Further, it exposes the individual to new ways of thinking, allowing greater cognitive flexibility, a trait linked to better mental health. Finally, educational achievement can foster an increase in self-worth (Ross & Huber, 1985).

Socioeconomic Level (SES)

Assessing socioeconomic level is complex, but generally includes measures of income, occupational status or prestige, education, or some combination of these. A longitudinal study of a sample in rural Canada found that the prevalence of depression was significantly and persistently higher in low SES populations than in other SES levels (Murphy et al., 1991). Reviews of community survey studies found similar and consistent results (Weiss and Kleinman, 1988; Link, Lennon, & Dohrenwend, 1993; Ross & Huber, 1985). An earlier study (Schwab, Bialow, Bronn, Holzer, & Stevenson, 1966) found more complex results in samples of medical inpatients in the U.S. Higher rates of depression were found in the upper socioeconomic group when judged by a clinical interview, while higher rates were found in the lower SES group when a standardized rating scale measured depression. An explanation given for this paradoxical result was that lower class patients tended to exhibit more somatic symptoms relative to their higher class cohorts, an expression of depression to which the rating scale is sensitive, but of which

clinicians often do not recognize during an interview (Bagley, 1973). In general, therefore, studies using self-report measures suggest that higher levels of depression are associated with lower SES.

Unfortunately, very little research has looked at depression and SES in other cultures. Higher rates of depression have been reported in less affluent countries compared to more affluent countries (e.g. Garcia-Alvarez, 1986), but no systematic studies have been conducted to help explain if this difference is actually due to differences in SES related variables. Boyacioglu and Karanci (1992) found no differences between employed and unemployed married Turkish women on a self-report measure of depression, while Canabal and Quiles (1995) found that for a sample of Puerto Rican men and women living in the U.S., poverty status and employment were more powerful predictors of depression severity than acculturation. The findings of these two studies are consistent with the literature concerning gender differences, in that the impact of employment is quite predictable in men, but not in women (Hall & Johnson, 1988).

Race and Ethnicity

Hirschfeld and Cross (1982) conducted a review of the literature on depressive symptoms in Blacks versus Whites in U.S. communities. They found that, although Blacks generally had higher prevalence rates of depressive symptoms than Whites, social class could account for the difference. Also, rates of bipolar and non-bipolar depressive disorders did not differ among Blacks and Whites. More recently, Culbertson (1997) reviewed the results of the first national mental health survey in the U.S. to use a World Health Organization modified diagnostic instrument especially developed for cross-

cultural work. Hispanics in the sample were the highest reporters of depression, whereas African Americans were the lowest reporters of depression. Another study compared nonclinical samples of Americans with Japanese, Chinese, or European ancestry and found that differences existed as a function of ethnicity, the type of depression measure used, and gender (Marsella, Sanborn, Kameoka, Shizuru, & Brennan, 1975).

The Beck Depression Inventory

The BDI has become one of the most popular self-report depression instruments used in clinical research today (Hatzenbuehler, Parpal, & Matthews, 1983). Even though it was originally constructed as a measure of depression severity in clinical populations (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), it has been shown to be a valid instrument for college populations (Bumberry, Oliver, & McClure, 1978). Within both non-patient college samples and in psychiatric samples, its construct validity has been established. In a sample of college students, both a measure of positive to negative statements and a measure of self-esteem were able to discriminate levels of depression as determined by the BDI (Madonna & Philpot, 1996). The BDI has also been found to correlate strongly with other standardized measures of depression (Bumberry et al. 1978; Bosscher, Koning, & Van Meurs, 1986; Brown, Schulberg, & Madonia, 1995; Bonicatto et al. 1998) as well as show moderate relationships with measures of constructs believed to be naturally associated with depression such as anxiety and hopelessness (Gorenstein, Pompéia, & Andrade, 1995; Robinson & Kelly, 1996; Jacobs & Boze, 1993; Bonicatto et al.). Its ability to discriminate between depressed and non-depressed groups has been

shown within college samples (Santor, Ramsay, & Zuroff, 1994) and clinical populations (Chan, 1991; Beck et al., 1961).

Research examining the reliability of the BDI over time has come up with complex results. Generally it has been concluded that scores are expected to remain relatively stable within a week's time, although changes may occur that have a significant effect on the classification of individuals into depression severity levels (Hatzenbueler et al. 1983). Studies investigating the effects of the process of BDI administration on subsequent BDI scores have found that subjects overall tend to report lower levels of depression severity on second BDI administrations (Sharpe & Gilbert, 1998; Chan, 1991). However, using other depression instruments, one study found that less depressed subjects tended to show more positive affect after completing the BDI while more depressed subjects tended to show more negative affect (Mark, Sinclair, & Wellens, 1991).

Findings on the BDI for gender differences have been "conflictual" (Beck et al. 1988). King and Buchwald (1982) have observed that on most nationwide and regional surveys in the U.S., women show higher rates of depression than men. However, studies using the BDI on college populations have consistently found no such difference (Santor et al. 1994; Baron & Matsuyama, 1988; Bryson & Pilon, 1984; Robbins & Tanck, 1984; Hammen & Padesky, 1977). In one study using a college sample, although no sex differences were found in total BDI scores, a discriminant function analysis using separate items revealed that women and men who were depressed showed different patterns of symptom expression (Hammen & Padesky). Sex differences in BDI scores do

appear in a couple cross-cultural studies; women scored higher than men in a Brazilian college sample (Gorenstein et al. 1995), and a "community resident" sample in Argentina (Bonicatto et al. 1998). However, in a study examining a Dutch version of the BDI, no such sex difference was observed (Bosscher et al. 1986). Part of this discrepancy between cultures may be explained at least partly by a finding that sexual differences may increase as level of income and education decrease (Yuhas, Radloff, & Kessler, 1980, as cited in King & Buchwald, 1982).

Beck et al. (1988), in their review of the literature, showed that many studies have found an inverse relationship between education and BDI scores. Years in college and marital status did not affect BDI scores in a sample of female college students and a sample of male and female university students (Brazelton, Greene, & Gynther, 1996; Lightfoot & Oliver, 1985). However, BDI scores were related to education and employment in a sample of chronic pain patients, and education in samples of drug abusers and unselected adults (Averill et al. 1996; Dorus & Senay, 1980; Oliver & Simmons, 1985).

The relationship between race and BDI scores has been examined in some studies. Beck et al. (1988) reviewed several studies showing that BDI scores were higher in blacks and nonwhites than in whites. However, the differences did not appear to be clinically meaningful (e.g. 1 point difference) and SES was rarely taken into account. In one study using undergraduate college students as participants, race was found to significantly discriminate "low," "middle," and "high" BDI scores, whereas age and gender only did so in combination with other variables (Madonna & Philpot, 1996).

However, there were no SES variables used in the analysis. Oliver and Simmons (1985) ran a multiple correlation analysis using 11 demographic variables to predict BDI scores and found both education and race to be significant predictors such that those with lower education scored higher than those with higher education and nonwhites scored higher than whites.

Cross-Cultural Use of the BDI

The advantages of using the BDI for cross-cultural use include its short format and relatively simple language. This language became more simplified in its 1971-revised form since certain changes were made, such as the elimination of double negatives (Beck & Steer, 1984). Such simplification of language has been recommended for measures that are intended to be translated. Possibly because of this characteristic and the instrument's strong empirical backing as a valid assessment of depression, the BDI has been translated into several languages including Spanish (Conde, Esteban, & Useros, 1976), German (Kammer, 1983 as cited in Beck et al. 1988), Turkish (Hisli, 1988 as cited in Ulusoy, Sahin, & Erkmen, 1998), Swedish (Hall & Johnson, 1988), Japanese (Baron & Matsuyama, 1988), Portuguese (Gorenstein et al. 1995), Dutch (Bosscher et al. 1986), Persian (Tashakkori, Barefoot, & Mehryar, 1989), Arabic (Abdel-Khalek, 1998), and Chinese (Chan, 1991).

One focus of using the BDI in cross-cultural research is to compare scores between populations of different countries to provide insight into both the nature of the measure itself and how aspects of depression may differ from one cultural group to another. For example, Tashakkori et al. (1989) examined BDI scores in a college sample

in Iran and found that Iranians scored consistently higher than scores taken from an American college population. It was speculated that this difference might have been due to socio-historical events, such as the recent Iran-Iraq war, that most likely contributed to higher dysphoric feelings. The two most general factors found after analysis were "helplessness" and "self-devaluation."

The accuracy of translating the BDI was specifically investigated in a study of bilingual Chinese undergraduate students (Chan, 1991). Each subject was asked to complete both an English and Chinese version of the scale with a one to seven-day interval between administrations. Administration followed a balanced procedure in which half the subjects received the English version first and the other half received the Chinese version first. It was found that both versions had high internal consistency, and the versions were highly correlated with each other. In a small sample of psychiatric patients with mixed diagnoses, there was also evidence that suggested that the Chinese version had good sensitivity. Despite a general overall correspondence between the two versions, the scales were found to differ on a few items. It was found that on the Chinese version, items were rated as more severe that dealt with sadness, dissatisfaction, and self-accusation, whereas on the English version, items that dealt with guilt and work retardation were rated more severely.

The finding of differences across cultural groups in how subjects respond to items on the BDI has prompted, in some cases, modifications to certain parts of the inventory in order to express the nuances of depression within those particular cultures (Beck et al. 1988). For example, before applying the instrument to a Hmong population, researchers

changed both the format (from a severity scale to a frequency scale) and the content (one item was split into two items to avoid confusion) to accommodate for cultural differences (Mouanoutoua et al. 1991). For the Iranian version, the last item was removed, as it referred to "interest in sex," a topic thought to be too sensitive for that particular culture (Tashakkori et al. 1989). However, in most cases, especially when applied to other Western cultures, no significant modifications have needed to be made beyond direct translation (Bonicatto et al. 1998). The BDI has been found to be both reliable and valid in several countries, including Argentina, Iran, the Netherlands, and China (Bonicatto et al.; Tashakkori et al.; Schotte, Maes, Cluydts, De Doncker, & Cosyns, 1997; & Chan, 1991, respectively).

Of particular interest to the proposed study is the development of the Argentinean version of the BDI (Bonicatto et al. 1998). Both Argentina and Brazil are Latin American countries, and their close proximity to one another would suggest that their cultures might be especially similar. The psychometric properties of the BDI were examined in a sample of "community residents." Specifically, analyses were conducted to test the scale's concurrent, construct, and criterion validities. It was found that the BDI correlated highly with another depression measure and moderately with a measure of hopelessness, as expected. Further, internal consistency was uniform across major demographic subgroups. As expected, scores were higher for women, those with less income, and those with less schooling. Subjects over age 60 had higher BDI scores than younger subjects. A factor analysis was also run using a principal component analysis on the scale's 21 items. After observing a two-factor solution from varimax rotation, the authors

suggested that the instrument might be conceptualized as having two subscales: "Cognitive-Affective" and "Somatic."

BDI Use in Brazil

The Portuguese version of the handbook on Beck's cognitive therapy and assessment was introduced to Brazil as early as 1979 and included a translation of the BDI in its appendix (Beck, Rush, Shaw, Emery, 1979). However, it has not been until recent years that research studies examining the BDI's psychometric properties in Brazil have been conducted. An extensive review of the literature by the present researcher found that validation studies of this instrument in Brazil did not appear to begin until 1995.

The BDI has received attention from researchers from at least three main urban areas in Brazil: Rio de Janeiro, São Paulo, and Porto Alegre. Studies from these researchers have provided normative and psychometric data to support the valid use of the instrument in Brazil with college populations. In addition, various studies have been conducted to examine the use of the BDI with clinical populations. Below is a brief summary of the results for the nonclinical studies conducted in Brazil followed by a brief description of the clinical studies that have been conducted in Brazil.

Ferreira (1995) administered the BDI to 228 male and 292 female university students from various institutions in Rio de Janeiro in order to adapt the instrument for use in Brazil. Rio de Janeiro is the capital of the state of Rio de Janeiro, located in the Southeast region of Brazil along the Atlantic coast. The age range for the participants was from 16 to 47 years, with an average of 23.5 years. Good discriminative power for all

items was evidenced through both item-total correlations and t-test analysis between the highest and lowest 25% of BDI scores. Adequate internal consistency was demonstrated, with BDI item intercorrelations revealing a Cronbach alpha coefficient of 0.79. Factor analysis using the principle component method and varimax rotation resulted in one major factor (negative self-evaluation) and two minor factors (somatic complaints and self-aggression).

Several studies were conducted in Porto Alegre in order to explore properties of the BDI in university students. Porto Alegre is the capital of the state of Rio Grande do Sul in the Southern region of Brazil. Cunha, Barraz, and colleagues (1995) administered both the BDI and the Beck Anxiety Inventory (BAI) to 48 female college students to see if there would be differences between "adolescent" (under 21 years) and "adult" (above 21 years) scores. They found no differences across the age groups nor across academic field (psychology vs. communications) for the BDI. However, psychology students were found to have lower scores than communications students on the BAI.

Cunha, Prieb, Goulart, and Lemes (1996) examined the test-retest reliability of the BDI in 299 university students with a mean age of 23 and an age range from 17 to 42. They found that, consistent with American studies, students scored lower on the second administration. The test also showed good internal consistency in this sample, with significant correlations among all the scale items.

Cunha, Prieb, Touginha, and Goulart (1996) completed a study using a much larger sample of university students from Porto Alegre (N = 1,186). They compared BDI scores with various clinical groups, including patients with dysthymic disorder, major

depression, anxiety disorders, dependence on alcohol and other substances, and non-specific psychiatric disorders. They found that the students scored significantly lower than each of the psychiatric samples. In the college sample, female students had significantly higher scores than male students. At the item level, female students reported higher severity than male students on eight symptoms: self-accusation, irritability, indecision, change in body image, fatigability, loss of appetite, somatic preoccupations, and loss of libido. A difference by age was also found, with those of 21 years or less having lower scores than those of 22 years or more. The age range was from 16 to 55 years with a mean of 22.88.

Several studies on the BDI were also conducted in São Paulo. São Paulo is the largest city in Brazil and is the capital of the state of São Paulo in the Southeast region of the country. Gorenstein et al. (1995) completed a study using 270 college students from various universities in São Paulo. Means were found to be comparable with data from other countries and the scale correlated significantly with the State Trait Anxiety Inventory (STAI). BDI scores were tested for differences across sex, age groups (=25, 26-30, 31-40, >40), and education (undergraduate vs. graduate). Significant differences were found between the sexes. Female students had higher scores than male students. There were no significant differences found among the age groups or educational levels.

Gorenstein and Andrade (1996) tested the BDI's ability to discriminate groups by comparing university students' scores with those of clinically depressed patients and clinically anxious patients. They found that the clinically depressed group had the highest mean score and the nonclinical student group had the lowest mean score. The same

authors carried out another study (1998), this time with adolescents from 13 to 17 years of age (N = 374). The study included administering the BDI to students of primary and secondary levels from both private and public schools in São Paulo. No differences were found among the school groups and no relationship was found between scores and age. Once again, however, female scores were higher than male scores. The distribution across symptom severity levels was similar to that for college students. Factor analysis revealed two factors for the total sample and for each sex, the first factor consisting of primarily cognitive-affective items, and the second factor consisting of primarily somatic items.

Gorenstein, Andrade, Filho, Tung, and Artes (1999) conducted a more recent study in São Paulo using a large sample of university students (N = 1,080) from mostly evening classes. Their purpose was to further explore the relationship between BDI scores and demographics and to provide additional information on the psychometric properties of the instrument in Brazil, specifically, to examine the scale's factor structure and discriminative ability. The results of a multiple regression analysis showed that gender, "work," and age were significant predictors of scores. Specifically, BDI scores tended to be higher for women, for those who worked, and for those who were younger. Women had significantly higher scores on the items self-dislike, fatigability, and somatic preoccupations. Subgroups of depression severity were formed using nonclinical cutoff scores, with scores above 20 being considered "depressed." The depressed subgroup showed significantly higher scores than the non-depressed subgroup on all individual items. Discriminant analysis using the BDI items showed that the scale highly

discriminated depressive symptomatology (97.5% correct classification) in this college sample. Three factors were extracted following a principal component analysis with varimax rotation for the entire sample. The authors labeled each factor: 1) low self-esteem dimension, 2) cognitive-affective dimension, and 3) somatic dimension. For the women's subgroup, two factors were extracted: 1) low self-esteem and cognitive-affective dimensions, and 2) somatic dimension. For the men's sub groups, the two factors were: 1) cognitive-affective dimension and 2) low self-esteem and somatic dimensions.

The BDI is becoming quite popular in Brazilian clinical research. It has been used to help assess the impact of socio-demographic variables on the mood of patients with panic disorder social phobia, and agoraphobia (Gomes de Matos, 1994; Barros & Neto, 1995), for examining the BDI's factor structure in chronic pain patients (Sarriera & Kroeff, 1995), and as a diagnostic screening instrument for males with erectile disorder (Rodrigues & Costa, 1987). There has also been extensive research using the BDI with alcoholics (Cunha, Oliveira, Touguinha, & Martins, 1995; Cunha, Oliveira, & Argimon, 1996; Gomes de Matos, Piedrabuena, & Karniol, 1984).

One notable study examined both the ability of BDI items to discriminate levels of depression as determined by a standardized clinical interview within a medical patient population, and the potential relationships that may exist between demographic variables and these levels of depression (Furlanetto, 1996). BDI items with the highest ability to discriminate between those with no depression or mild levels of depressive symptomatology and those with moderate to severe levels of depressive symptomatology were social withdrawal, pessimism, irritability, and loss of libido. Using both chi-square

and Fisher's Exact tests, the authors found that compared with the patients who had no depression or mild levels of depression, the patients with moderate to severe levels of depression had higher percentages of women; those who were either widowed, separated, or divorced; those with a history of depression; and those using benzodiazepines.

CHAPTER II

PURPOSE AND RATIONALE OF THE PRESENT STUDY

Limitations of Studies on the BDI in Brazil

Although it would seem that the research base on the Beck Depression Inventory (BDI) in Brazil is becoming substantial, there still remain areas that need to be addressed to arrive at a more comprehensive assessment of the BDI's psychometric properties in this country. The sole use of college students for the nonclinical samples has restricted researchers from optimally examining the effect of certain demographics, such as education, on BDI scores. This restriction in demographic range may have also hindered past researchers' ability to appropriately compare the nonclinical sample with a demographically different clinical sample. Other demographics such as race and ethnicity have basically been ignored.

Age of nonclinical participants, for example, have mainly centered around the early to mid 20s. Even when age ranges have been relatively extensive, the average ages were still relatively young, and frequency distributions of age were never reported. One notable example is the study conducted by Gorenstein, Pompéia, and Andrade (1995). They compared BDI scores across four age categories ($\leq$25, 26-30, 31-40, >40); however, the average age was 23.8 years, suggesting a sample highly skewed toward the young end.

It can be argued that no study so far has adequately compared adolescent scores with those of adults. Cunha, Prieb, Touginha, and Goulart (1996) compared college students 21 years or younger with college students above age 21 and found that the younger group had lower BDI scores. However, the difference was less than one point on the scale and the sample size was quite large (N = 1,186), suggesting that such a finding may have little practical significance. Further, although the age range given was from age 16 to 21, the fact that subjects were all college students suggests that the majority of subjects in this group were between ages 18 and 21. Therefore, the "adolescent" group most likely represented young adults rather than adolescents. A group that more accurately represented adolescents in terms of age was the sample used in the Gorenstein and Andrade study (1998) in which their participants ranged in age from 13 to 17. The latter authors found important information regarding adolescents and the BDI. However, they did not compare adolescent scores with those of adults, and therefore, there remains a need for more information regarding the relationship between BDI scores and age in Brazil.

Socioeconomic variables have for the most part been ignored in the studies so far. Only one of the studies reviewed here attempted to specifically examine socioeconomic variables and BDI scores. Using university students attending evening courses, Gorenstein, Andrade, Filho, Tung, and Artes (1999) included a "work" variable in a regression analysis to predict BDI scores. Contrary to what most studies on depression have found, their results indicated that students who worked had higher scores than students who did not work. The authors explained this finding by suggesting that since

participants were students attending evening courses, those who worked during the day probably were experiencing more stress and fatigue than students who did not work as a result of a busier schedule. In other words, rather than being a measure of socioeconomic status, their "work" variable possibly represented a component of daily stressors. Education also is a common variable used to measure an aspect of socioeconomic status, but this also has received little attention in the literature on BDI use in Brazil. In nonclinical samples, the sole use of college students for measuring education level has limited researchers to within a small range, such as undergraduate versus graduate level (see Gorenstein et al. 1995).

Within clinical populations in Brazil, examination of demographic variables in regards to BDI results is virtually nonexistent. Inattention to demographics can bring about potentially misleading results in research analyses. For example, in the Gorenstein and Andrade (1996) study, a significant difference in BDI scores was found between nonclinical and clinical participants, thus suggesting evidence for the instrument's criterion validity. However, the average age difference between the groups was substantial (nonclinical $\underline{M}$ = 23.8; clinical $\underline{M}$ = 49.6). Examination of the potential relationship between age and BDI scores may have been important in order to adequately interpret the results.

Finally, prior research on the BDI has restricted sampling to the main southern urban areas of Brazil: Rio de Janeiro (Ferreira, 1995; Furlanetto, 1996), São Paulo (Gorenstein et al. 1999; Gorenstein & Andrade, 1998; Gorenstein & Andrade, 1996; Gorenstein et al. 1995), and Porto Alegre (Cunha, Prieb, Goulart, & Lemes, 1996; Cunha,

Prieb, Touginha, & Goulart, 1996; Cunha & Barraz et al., 1995). Therefore, there is a need to provide normative data for regions of Brazil that have mostly been neglected in psychological research.

Research Objectives

The purpose of the present study was to explore various properties of the BDI when applied to clinical and nonclinical populations of northern Brazil. Such exploration would serve both as a preliminary step in assessing the BDI's validity within this region and as part of the ongoing process of expanding its use and improving its interpretability in the Brazilian population as a whole. To accomplish this, there were three main objectives.

The first objective was to add to the existing psychometric data on the BDI in Brazil for purposes of expanding normative information and examining potential differences across regions of Brazil. This was done by collecting data from samples in northern Brazil and comparing results with those of other studies already conducted. Psychometric properties examined included internal consistency, means, and factor structures. To date, only psychometric data from student samples of Rio de Janeiro, São Paulo, and Porto Alegre had been gathered, all urban areas in the South of Brazil. As Bonicatto, Dew, and Soria (1998) pointed out, an instrument's properties may need to be assessed specifically for a given population where the culture is unique even though the language is the same as that of a population where the instrument had already been validated. For example, there may be important differences in how the people conceptualize certain depressive symptoms. These differences, in turn, may have effects

on an instrument's psychometric properties. In Brazil, it can be argued that a population in southern Brazil may have a different culture and unique characteristics from a population in northern Brazil due to the great geographical distance between the two areas and the unique history and relative isolation that the northern region possesses. Whether the scale possesses unique psychometric properties in this region's population is an empirical question that ought to be answered if the scale is to be used in Brazil in general. As the present study would take place in a northern region of Brazil (specifically, in the city of Boa Vista in the state of Roraima), it would be an important step in assessing the generalizability of this scale for use in the country as a whole.

A second objective was to examine the possible relationships between various demographic variables (sex, age, ethnicity, and socioeconomic characteristics) and the BDI. As already mentioned, except for gender, the studies carried out so far in Brazil on the BDI had either ignored demographic variables or had used samples that did not permit adequate range and variability to allow for thorough examination of these characteristics. Clearly, an accurate understanding of the effects that certain demographics may have on the results of a clinical instrument is paramount for accurate interpretation of the instrument's results in a clinical situation. Further, such information is needed for a better understanding of the scale's properties across cultures, and for a better understanding of depression from both a cross-cultural perspective and as a universal concept.

A third objective of the present study was to examine the BDI's ability to discriminate between clinically depressed individuals and nonclinical individuals while

taking into account demographic factors that may contribute to differences in BDI scores. As mentioned previously, a couple of studies in Brazil had examined differences between clinical and nonclinical groups. However, one study did not include any demographic information regarding the clinical groups (Cunha, Prieb, Toughinha, & Goulart, 1996) while the other study only reported age (Gorenstein & Andrade, 1996). In neither case were demographic differences directly addressed. Appropriate comparisons must be made to rule out that differences between clinical and nonclinical populations are due to demographic differences rather than the psychopathology the scale is purported to measure.

Research Hypotheses

Formulation and Rationale

The BDI was expected to show sound psychometric properties in the population of Boa Vista. This was based on the fact that most cross-cultural studies have shown the BDI to be a valid measure of depression in various populations that are thought to be culturally different than the population from where the scale was originally developed. Although there have been exceptions that have required modifications in the scale, these cases were generally of non-Western cultures where significant differences in interpreting and expressing symptoms were more expected. Within populations of Western European heritage, the BDI has consistently been shown to be a valid instrument without the need for scale modifications beyond direct linguistic translation. Further, the scale has already been shown to be a valid measure within various populations in southern Brazil, and although a northern Brazilian population may be in ways culturally different from

southern populations, this difference was not expected to lead to the need for special adaptation of the instrument.

Given the above assumptions, it was expected that the BDI would show high internal consistency and scale scores would adequately be able to discriminate between nonclinical participants and participants who were diagnosed as clinically depressed. This would be consistent with a multitude of studies on the BDI that has shown high internal consistency values for various populations and research that has shown the BDI's ability to differentiate clinical groups from nonclinical groups.

It was also expected that certain demographics would be related to BDI scores. Consistent with the literature, females were expected to have higher scores than males. Although several U.S. studies have shown no such sex differences within college samples, higher female to male scores have been found within Brazilian college samples. Therefore, such gender difference would be expected in all samples of the present study, even among college students.

Consistent with many studies conducted in the U.S. (see review by Richter, Werner, Heerlein, Kraus, & Sauer, 1998), it was expected that adolescents would have higher BDI scores than adults. This may seem to run counter to at least one study in Brazil that found that younger individuals had lower scores than older individuals (Cunha, Prieb, Toughinha, & Goulart, 1996). However, in that study, the younger group did not appear to represent a distinct group of adolescents, but rather, a mix group of younger adults and older adolescents.

The three socioeconomic variables used in the present study (education, occupational status, and income) were all expected to have an inverse relationship with BDI scores, as this has been a consistent finding in the literature. It was also expected that ethnicity would be related to BDI scores, with those who identify themselves as "indigenous" having higher scores than those who identify themselves as "non-indigenous."

The following is a list of research hypotheses. The "nonclinical" sample refers to those who were not receiving psychological or psychiatric treatment, and the "clinical" sample refers to those who were diagnosed with clinical depression.

List of Research Hypotheses

(1) Adequate internal consistency would be found among the BDI items for both nonclinical and clinical samples.

(2) Females were expected to have higher BDI scores than males in all nonclinical samples.

(3) For nonclinical respondents, BDI scores were expected to differ as a function of educational, income, and occupational status levels in an inverse direction. Specifically, those with a lower education level, lower income, and a lower occupational status would have higher scores than those with higher levels on these variables.

(4) For nonclinical respondents, adolescents were expected to have higher BDI scores than adults.

(5) For nonclinical respondents, participants who identified themselves as "indigenous" were expected to have higher BDI scores than those who identified themselves as "non-indigenous."

(6) Clinical participants were expected to have higher BDI scores than nonclinical participants while taking demographic variables into account.

CHAPTER III

METHOD

The Geographical Area and Population of Study

A brief geographical description and history of the area of study will be presented in this section, followed by a description of some of the demographic characteristics of the population from this area. Socioeconomic demographics will be compared with those of populations from the southern and southeastern regions of Brazil, where previous studies on the BDI were conducted. It is hoped that this will aid in interpreting the data obtained from the present study.

Boa Vista is a city of about 150,000 and is the capital of Roraima, the northernmost Brazilian state (IBGE, 1997). Both geographical location and history has made the population in this area unique for Brazil. Lying in the northern section of the Amazon basin on the Rio Branco, and about three hours drive from Venezuela, Boa Vista is relatively isolated from the rest of Brazil. Only until the last decade has there been a paved road that connects this city with Venezuela to the north. Sections of the highway that connect Boa Vista with the closest other major urban area in Brazil, Manaus, was not yet paved until 1998. Even paved, the trip takes about a day. Easier travel to and from Venezuela, versus to and from other regions of Brazil, and the cheaper price of Venezuelan goods (until recently) have arguably led to a relatively strong Venezuelan influence in this population (Lemos, 1998).

Boa Vista began in the 1940s as a village that served as a social center for cattle ranchers in the region. During that time, there was a large influx of non-indigenous Brazilians, mainly from the Northeast region of Brazil. Many of these immigrants came to escape drought conditions and to find employment. From the late 1980s, another significant influx of immigrants from various parts of Brazil came to Roraima as part of a gold rush. Many of these gold miners (garimpeiros) invaded federally protected indigenous lands, but the vast majority have since been expelled from these lands and are now incorporated mostly in the working class sectors of Boa Vista.

For Brazil, a common classification system for race includes the following categories (with a rough translation): branca (White), preta (Black), parda (Mulatto), amarela (Asian), and indígena (indigenous or "Brazilian Indian"). There are no statistics yet describing racial/ethnic makeup specifically for the Boa Vista or Roraima population; however, in 1996 it was calculated that for northern urban areas in general, 28.5% of inhabitants were classified as White, 3.7% as Black, 67.2% as Mulatto, 0.4% as Asian, and 0.2% as indigenous (IBGE, 1997). However, the use of such race classifications in Brazil has been strongly criticized. The arguments include that race in Brazil is a social construct based on a combination of physical appearance and social standing (Penha-Lopes, 1996), and that classifying race in Brazil is an arbitrary process (Harris, Consorte, Lang, & Byrne, 1993). Therefore, for purposes of the present study, the focus will be on measuring ethnicity rather than race.

Rivière (1972) described a system of classifying ethnicity for Roraima. He explained that in the major populated areas, people generally belong to one of two

groups: the caboclos or the brancos. Brancos, meaning literally "Whites," mainly refers to those with an ethnic mixture of Portuguese and other European nations, African, and Amerindian. Rivière explained that this ethnic combination is nearly ubiquitous in the mainstream Brazilian population as a whole. Caboclo refers to Amerindians who have adopted or inherited the ways of mainstream Brazilian life, as opposed to tribal life. Rivière pointed out that to refer to someone as a caboclo is highly derogatory, since the term connotes someone who is less "civilized" than the brancos. Also, the meaning of the term can vary from region to region. In place of branco and caboclo, Lemos (1998) used the terms "indigenous" and "non-indigenous" in her study of ethnicity and land distribution in Roraima. It was thought that the terms were more neutral in connotation and might more accurately reflect the ethnic make-up in the population.

Roraima, formerly the Federal Territory of Roraima, did not receive statehood until 1988. Unlike long-established Brazilian states further to the south and east, Roraima still contains a significant number of "indigenous" people, or self-identified Brazilian Indians. Many have emigrated from their respective village locales (malocas) to Boa Vista. There is reason to believe that the percentage of indigenous people in Boa Vista is significantly greater than the 0.2% noted above for northern urban areas in general, with a more accurate estimate being at least 5% (A.M. Lemos, personal communication, February, 1999).

Data from IBGE (Instituto Brasileiro de Geografia e Estatística, 1997) suggests that, compared with populations from southern regions of Brazil, people in northern regions of Brazil have less formal education. For example, while 9% of the population in

the Southeast region of Brazil and just over 8% of the population in the South region of Brazil have had less than a year of schooling, nearly 14% of the population in North region of Brazil have had less than a year of schooling. Income levels between the populations also show a difference, with 1998 average monthly income in the North region being R$246 (?U.S$140), compared with R$391 (?U.S$225) and R$349 (?U.S$200) in the South and Southeast regions, respectively.[1] However, accurate comparisons are difficult to make considering that the northern Brazilian data only includes those from urban areas while that of the other regions also include people from rural areas. Comparison of urban populations among all regions was used for illiteracy data, and shows that the northern populations have a higher rate of illiteracy than populations in the Southern and Southeastern regions (11.8% versus 6.5% and 6.4%, respectively). Therefore, there is good evidence that the population in Boa Vista may, on average, be less formally educated and have lower income than those in southern urban areas, such as São Paulo, Porto Alegre, and Rio de Janeiro.

Participant Recruitment

Brazilians were recruited from various locations of Boa Vista, Roraima to participate in the present study during the Spring and Summer of 1999. Participants for the clinical sample were patients diagnosed with clinical depression. They were recruited from various medical treatment centers in the city. The selection of respondents for the nonclinical sample was made with the goal of forming a data set that had adequate range

[1] The monthly income data used here is based on wage earners starting from the age of 10. Therefore, conducting accurate comparisons between these results and available average U.S. income may be difficult. As of 1999, the minimum monthly wage in Brazil was R$136 (about U.S$78).

in the area of age, income, occupational status, and education so that possible relationships between these characteristics and BDI scores could effectively be tested. These nonclinical participants were mostly students recruited from three main areas. Each of these areas will now be discussed, followed by a description of the recruiting process for the clinical group participants.

Nonclinical Participants

The three main areas for recruiting nonclinical participants were a university, a magisterio school, and a night school. The magisterio and night school participants each formed a distinct group, while the university participants formed two distinct groups. Respondents from all three areas were students. Also, additional participants were recruited from various other locations to form a miscellaneous nonclinical group. Each of these groups will now be described in more detail.

The university respondents were recruited from the Universidade Federal de Roraima (UFRR). Federal universities in Brazil, although free, are fairly stringent on their admission policies. As there are a limited number of student positions, those who wish to enter must pass difficult academic exams (5% who take the exam are accepted). Curriculums in Brazilian high schools include an optional year, called cursinho, which is specially tailored for the students who hope to pass such exams. These are most often provided in private schools, which are the domain for the high middle to upper social classes. The creation of UFRR in 1991 stimulated the growth in Boa Vista of private schools that offered cursinhos. Therefore, it was believed that the university pool would

likely provide data from those who were mainly from the middle to upper classes and had high educational experience.

The university students in the present study can be thought of as coming from two different groups. The first group included "mainstream" students, or those who entered the university through the system described above. In the present study, these students will be referred to simply as "university" students. The second group was students involved in a program called CEFAM.[2] These were teachers of secondary schools who graduated only with high school degrees from "magisterio," a branch of high school that prepares students for a teaching career. These teachers had entered the university in order to earn advanced degrees as part of a recent federal requirement. The teachers do not compete with mainstream students for entrance, but do need to compete among themselves.

The second area where nonclinical participants were recruited was in "magisterio," the branch of high school that specifically prepares students for careers in teaching. Their social status was expected to be from low to middle levels, as these schools are public and tuition is free.

The third area of recruitment was in adult night school. The students studying in these evening courses had returned to school to improve on their reading and writing

[2] CEFAM (Centro Educacional de Formação e Aperfeiçoamento do Magisterio) Recently there had been a federal law passed in Brazil that requires that certain professionals have advanced degrees or certificates to practice (Monlevade, 1997, Article 63, p. 156). An agreement was made between the state of Roraima and the federal government to have teachers without advanced degrees who now fall under this law to be admitted into the university without having to compete with mainstream students for college entrance (GER/SECD/UFFR, 1998).

skills. Most have had relatively little schooling and none have entered the secondary level of education.

The selection of participants from the first three areas above represented three levels of education (primary, secondary, and tertiary), and it was expected that participants would vary significantly in terms of age, occupational status, and income level both within each sample and between the samples.

In addition to the participants recruited in the three main areas above, participants were also gathered from various other locales to form a miscellaneous group. This group consisted of military students, members of a Baptist church, technical school students, and teachers. The military students were individuals studying for a specialization in police work. They were administered the materials by a psychiatrist working at one of the public health centers. The Baptist church members were administered the materials by a psychologist who worked at the university. The technical school students were participants recruited by both a neurologist and a psychologist working at a general hospital. These participants were students taking courses at nearby technical schools. Technical schools in Brazil are a branch of secondary education, rather than of tertiary education as is normally the case in the U.S. Finally, the teachers used in this group were those working in magisterio, technical, and night schools that were not students in the CEFAM program during the time of this study. All these participants combined to form a relatively small sample as compared with those from the other three areas. Participants were recruited from these areas in order to increase sample size and add variation to the combination of demographics that would be examined.

Participation for the nonclinical groups was entirely voluntary and students were told ahead of time that they could refuse to participate or leave during the administration without penalty toward their academic standing. Professors advised the students at least a day in advance that a researcher would come to the classroom, explain the study, and then ask for volunteers to participate. Students were not offered any specific incentive as it was believed that the break from regular classroom routine would be incentive enough for participation. Also, recruitment of participants was not expected to be difficult since the administration time of completing the testing materials would, in most cases, be less than 15 minutes. Those who reported that they were currently receiving psychological or psychiatric treatment, and those who were under the age of 13 were excluded from the final analyses.

Clinical Participants

Other participants were needed for testing the BDI's ability to discriminate between nonclinical respondents and respondents who were clinically depressed. These participants included patients recently admitted to both psychiatric treatment centers and community health centers in Boa Vista. Those diagnosed with a depressive disorder were asked to participate as part of their clinical evaluation. Due to the relatively few psychiatrists and psychologists working in Boa Vista, it was not expected that there would be a substantial number of patients with clinical depression available to be able to examine all the characteristics being tested for with the nonclinical samples. Therefore, it was planned that a minimum of 38 patients would be recruited in order to test for differences in BDI scores between clinical and nonclinical groups. Consistent with a

previous study conducted in Brazil (Furlanetto, 1996), it was planned that only patients who had been admitted for treatment within the last 72 hours would be included in the final analysis. This would have helped exclude data of patients who were experiencing treatment-related improvement that could mask the effect of depression on BDI scores. Nevertheless, data was also gathered on patients who had been receiving treatment past the 72-hour period so that it may be used if there were not enough clinical respondents. Only those of at least age 13 were included in the final analysis, to be consistent with the expected age range of the nonclinical samples.

Clinical respondents were recruited from five state-run medical centers in Boa Vista: a general hospital, a triage department of a medical administration center, and two community health clinics. Recruitment and the administration of materials was handled in the hospital by a neurologist, a psychiatrist, and three psychologists; in the triage department by another psychiatrist; and in the two community health clinics by two other psychologists. The general hospital was located in the city center while the triage department was located towards the northern end of the city. The community health clinics were located in distinct zones of the city. One clinic was located just outside of the city center, and the other towards the outskirts of town. Such variation in location was expected to lead to a sample with a significant range on age and socioeconomic factors. Each mental health professional involved in the study was approached with a letter explaining the purpose of the study and explained in detail the method of administration. They were also visited periodically for review and to answer any questions. As with the nonclinical group, participation by the respondents was voluntary and an explanation of

the study was given to the patient before they were asked to complete the materials. Again, no specific incentive was given for participation.

Materials

Beck Depression Inventory (BDI)

The BDI was originally constructed as a clinical measure of depression severity. Its items were based on clinical observations of attitudes and symptoms frequently displayed by depressed psychiatric patients and infrequently displayed by non-depressed psychiatric patients (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). In 1971 the scale was revised, resulting in the BDI version that has been most commonly used since 1972 to the present day. The scale was not developed to reflect any particular theory of depression, nor to diagnose depression. Nevertheless, it has become one of the most widely used instruments today for assessing the degree of depressive symptomatology in clinical cases and for detecting possible depression in nonclinical populations (Beck & Steer, 1987). It has also been used extensively in cross-cultural studies to provide effective assessment tools for depression for different populations around the world, as well as to provide a measure for further understanding depression from a cross-cultural perspective. The scale was developed to be used with both adolescents and adults, and has been used with adolescents as young as 13 (Beck & Steer).

The respondents are asked to select a statement or statements from each of 21 items that best describes what they have been experiencing within the last week, including today. The statements are in order of degree of intensity on a four-point scale, from 0 to 3. Each item represents a symptom of depression and include the following: (1)

mood, (2) pessimism, (3) sense of failure, (4) lack of satisfaction, (5) guilt feelings, (6) sense of punishment, (7) self-dislike, (8) self-accusation, (9) suicidal wishes, (10) crying, (11) irritability, (12) social withdrawal, (13) indecisiveness, (14) distortion of body image, (15) work inhibition, (16) sleep disturbance, (17) fatigability, (18) loss of appetite, (19) weight loss, (20) somatic preoccupation, and (21) loss of libido. The scale is scored by summing the points from the highest rating selected for each item. A special case is Item 19, which asks about weight loss. If the person has indicated that they were intentionally trying to lose weight, points from this item are not added to the total. The maximum total score of the BDI is 63.

The scale can either be administered orally in its entirety by an examiner or be self-administered with the initial directions being read by the examiner. Administration time is generally from 5 to 10 minutes when self-administered, and around 15 minutes when administered orally. During oral administration, if the respondent selects a statement by giving a number, the statement is read back by the examiner to ensure that the appropriate one has been selected (Beck & Steer, 1987).

Richter and colleagues (1998) conducted a comprehensive review on the psychometric properties of the BDI. Because of the recentness of the information their review provides, their results will be presented here.

Internal consistency of the BDI has been confirmed by several studies in both clinical and nonclinical samples. Alpha-coefficient averages are generally reported to be higher than .75. One German researcher reported coefficient averages to be higher for psychiatric samples (.88) than non-psychiatric samples (.82). For studies using more

homogenous samples, coefficients tend to be significantly lower. Stability, as measured by retest reliability, is higher in non-psychiatric samples than psychiatric samples, and higher in short temporal distances than long temporal distances.

The BDI appears to have high content validity. One study compared BDI items with the DSM-III criteria and found that the BDI reflected the majority of the DSM-III criteria well. Convergent validity has been assessed by several studies and all have reported moderate to high correlations with other self-rating scales. When the BDI was compared with observer rating scales, the coefficients tended to vary more, with lower concurrence seen with more acutely distressed patients beginning inpatient treatment. Finally, discriminant validity studies have shown mixed results. In general, the BDI has been shown to discriminate well between depressives and non-depressives. However, when comparing BDI scores with scores from self-rating anxiety scales, correlations were shown to be nearly as high as those between different self-rating scales for measuring depression.

A Portuguese translation of the BDI was available as early as 1979 (see appendix in Beck, Rush, Shaw, & Emery, 1979); however, a relatively new translation was made in 1995 specifically for adapting the scale for use with the Brazilian population. Ferreira (1995), the main author of the study, explained that the scale was translated by a bilingual psychologist and revised afterwards by another bilingual psychologist. It was then applied to a sample of university students from various academic institutions in Rio de Janeiro. The scale reportedly showed good psychometric properties including good discriminative power from all 21 items. High internal consistency ($r_? = 0.86$; $r_? = .84$)

was reported for Brazilian college students in two studies (Gorenstein, Andrade, Filho, Tung, & Artes, 1999; Cunha, Prieb, Goulart, & Lemes, 1996). High internal consistency ($r_? = .85$) was also reported for those with alcoholism (Cunha & Oliveira et al. 1996). Retest reliability was assessed during a 2-week period for college students, showing a moderate correlation between the two testing periods ($r = .40$) and lower scores on the second administration (Cunha, Prieb, Goulart, & Lemes). Evidence for criterion validity was demonstrated for the BDI, showing that the scale could differentiate between patients with depression, patients with anxiety, and nonclinical college students (Gorenstein & Andrade, 1996).

Demographic Questionnaire

The present author and collaborators, including a Brazilian psychologist and Brazilian anthropologist, developed a questionnaire in order to gather demographic information. The form asked respondents to provide information on gender; age; ethnicity; marital status; with whom they were living; how many cohabitants in the household; how many children they had; how many children in the household; profession of respondent, father, mother, and spouse; monthly salary; family income; number of years living in Boa Vista and/or Roraima; number of years of formal education; and level of education. In addition, respondents were asked if they were currently in therapy with a professional for emotional problems or if they were currently taking prescription medication, and if so, which one(s). The final question asked them what other type of help they were seeking for emotional problems.

The final section of the questionnaire asked about psychiatric history. The importance of this last section was to determine which participants to exclude for the final analyses. However, in the Brazilian culture, especially among the lower social class, having a psychiatric history or receiving psychological treatment often carries a stigma. Therefore, the questions were more general and put in layman's terms. They were asked about "prescription" medication, rather than "psychiatric" medication, and were asked to write in the name of the medication and what it was being used for. They were also asked if they were currently participating in "professional therapy for emotional problems," rather than if they were receiving "psychiatric" or "psychological treatment." Although some people may have been reluctant to answer truthfully to these two type of questions, it was felt that wording it so would encourage more truthful responses and less omissions than if they had been asked directly about psychological treatment and psychiatric medication. Further, the final question, asking about what other help they were receiving for emotional problems, was used in order to facilitate an understanding of the distinction between formal and informal therapy and, therefore, to procure more accurate responses regarding psychiatric history.

Procedure

When possible, data gathering was conducted through group administration. For convenience, some participants were administered the scales individually. Also when convenient, the directions and items of the BDI were read out loud to participants. This option was given as it was expected that some of the students' reading level would be low. A well-designed study by King and Buchwald (1982) found that scores from

subjects who were able to complete the BDI in private without an examiner present and those from subjects who were asked to respond verbally when facing an examiner did not differ significantly. Therefore, it was assumed that the effect from testing format (group vs. individual) and whether the scale was read to the respondent or not, would be negligible.

For the nonclinical respondents, almost all were administered the BDI in group format. The total number of participants who were administered the scale individually was 32, or about 7% of the total nonclinical sample. The proportion of these respondents differed across sample groups. About 14% of the magisterio students and 23% of the miscellaneous nonclinical participants were administered the BDI in individual format. None of the university, CEFAM, or night school students were administered the BDI in individual format. The total number of subjects who had the BDI read to them was 56, or about 12% of the total nonclinical sample. None of the university or CEFAM students had the BDI read to them, whereas about 10% of night school students, 14% of the magisterio students, and 60% of the miscellaneous nonclinical participants had it read to them. For the clinical respondents, all were administered the scale individually. Also, about 68% of the clinical respondents had the BDI read to them.

All participants were provided with a brief description regarding the purpose of their participation in the study. It was explained to them that their participation would provide normative data for an instrument used to assess mood states in Brazil, and that the data they provided would be used for research purposes only. They were assured of anonymity and told that no names would be connected with the protocols. They were also

told that at any time during the testing process, they could terminate their participation without penalty. It was explained to them that any information gained from this study would be available to them upon request free of charge, including any publication material. Participants were encouraged to ask questions at any time regarding the content of the material, what was expected of them, or the reason for their participation. Participants were provided with a form containing the above information along with the names of the researchers, the affiliated institution, and phone numbers where the researchers could be reached.

After subjects had read the consent forms, they were handed a packet that included the demographic questionnaire and the BDI to complete. The packet also included another short instrument that is not a focus of the present study and, therefore, will not be discussed in this work. All materials for the participants were administered either by a psychologist, psychiatrist, or neurologist. All these health professionals were Brazilian nationals who were specifically trained for administering the BDI and accompanying materials for this study. For the clinical respondents, materials were administered during their treatment assessment.

Data Analysis

Formation of Variables

Main independent variables in the study included the following: gender, age, marital status, ethnicity, household size, occupation, income, education, and time of residence. All of this information was gathered from the demographic questionnaire. Much of this information was transformed into categories or indexes to simplify

subsequent analyses. The information was to be used to address the research hypotheses as well as supply data for exploratory and future studies.

Gender included the choices "male" or "female" and was treated as a dichotomous variable. Age was included in analyses as a continuous variable; however, it was also broken down into age groups based on its distribution in the nonclinical samples. Using age groups would allow a more detailed inspection of the possible relationship between BDI scores and age. It would also make it easier to compare results with previous studies that have used age range classifications. The decision to use the age distribution of the sample rather than preset age ranges to form the age groups was to ensure that there would be adequate numbers within each age level for effective statistical analysis.

Marital Status included the following choices: "single," "married," "widowed," "divorced," or "separated." Another item, asking for with whom the respondent was living (Type of Cohabitant), was included to reveal more details regarding the respondent's living situation. This would be especially important concerning the calculation of occupational status, as will be discussed later. Choices for this latter item included "spouse," "parents," "alone," and "others." It was also important in identifying those who were living with a significant other but were not legally married. In these cases, the individuals were counted as "married" in the analysis.[3] Household size actually

[3] In recent years it has been common for couples in Brazil to live together without formal marriage and still be considered "married" both in a social and legal sense. For example, a heterosexual couple can live together without having been officially married, and within five years can receive some of the same financial benefits and rights that officially married couples receive. Therefore, the person may either consider themselves "single" or "married."

describes a set of related items and variables. Respondents were asked how many children they had, how many children were living with them, and how many people were living in the household. All these items were presented as open-ended questions.

Ethnic information was gathered through a single question asking if the respondents considered themselves "indigenous" or "non-indigenous." It is common in research on depression measures to consider race or ethnicity as potential factors regarding population differences. There has been a growing interest to include such variables in cross-cultural research. For the present study, only ethnic identity was used as a variable. As discussed previously, using race as a variable for research in Brazil has been controversial, and many have questioned if it can be reliably measured in Brazil.[4] Therefore, it was felt that including race as a variable would add more confusion than interpretive value to the present study. Ethnic identity, on the other hand, appeared to have a more salient meaning in this culture and was thought to be a reliable enough measure for this study.

Occupational status was based on levels developed by Valle Silva (as cited in Pastore, 1982). Valle Silva placed Brazilian occupational titles in a hierarchy based on standardized values. The author calculated these values by following a series of methodological steps, which included combining estimated income means for educational level and occupational title. These were then listed and divided into 6 "social strata" from

[4] Penha-Lopes (1996) argued that racial identity in Brazil depends on visual appearance and social standing, rather than on blood heritage as it does in the U.S. This results in a system that contains a multitude of possible categories whose membership is somewhat defined by social status. Harris, Consorte, Lang, and Byrne (1993) demonstrated the arbitrariness of racial categories in Brazil by showing that the percentage of those identifying themselves as mixed color-race changes significantly depending on the label used.

an “upper” level to a “lower-lower” level. For the present study, the strata were combined to form three groups (see Appendix B). A case would be assigned to an occupational status level based on the occupation they reported on the demographic questionnaire. However, as not all respondents would have jobs, it was necessary to make some modifications. For those respondents who lived with a spouse, the highest value between the respondent and spouse was used. If neither specified employment, the highest value of either parent’s occupation was used. For those living with a parent, the highest value of either parent was used. For those living alone or with “others,” the value of the respondent was used, and if no occupational title was given, the highest value of either parent was used. These modifications were used based on the assumption that the financial provider of an unemployed respondent would primarily be a spouse, and then a parent.

The income of respondents was measured two ways on the questionnaire: monthly salary and household income. Salary is calculated by the month in Brazil. Therefore, the value for salary on the questionnaire would represent the amount the respondent reported they receive every month. Unfortunately, after preliminary observation of the data, it was decided that salary would not be used in subsequent analysis, as a substantial number of respondents did not report any individual income. Nearly all respondents, on the other hand, reported household income. Household income on the questionnaire was divided into six groups. The groups were based on the number of minimum salaries the household receives. This is the official categorization of income in Brazil and is often used both for statistical purposes and as part of the process of

completing applications for credit and other business. It is common for one to know under which category one's household income falls and, therefore, it can be assumed that this measure is reliable. For analysis in this study, the six groups were combined into three ordinal groups to allow for adequate cell sizes and easier comparison with occupation and education. For convenience, at times household income will be referred to as just "income" in this paper.

Education was measured both by number of years of "formal education" and by three ordinal levels: (1) primary, (2) secondary, and (3) tertiary. Unfortunately, initial evaluation of the data revealed that the number of years of schooling reported by the respondents was highly variable, even within each educational group. Observation during administration of the questionnaire suggested that some respondents had great difficulty remembering the amount of years they had gone to school. In some cases, respondents were heard repeating years they had already counted. It was deduced that respondents did not interpret "formal education" consistently, and therefore, education as a continuous variable was not used in this study.

In general, nonclinical sample groups in this study represented the educational levels. For example, the university and CEFAM students all fell under the tertiary level, the magisterio students under the secondary level, and the night school students under the primary level. The miscellaneous nonclinical sample was a heterogeneous group in terms of educational level. Technically, the primary group was defined as those who had not entered the secondary level of education, the secondary group was those who had some

secondary education but no tertiary education, and the tertiary group were those who had at least some tertiary education.[5]

A combination of educational level and occupational status was used to form a socioeconomic status (SES) index to see if such a measure could aid in assessing a possible relationship between SES and the BDI in this population. The SES index developed for this study was calculated using a weighting method employed in past cross-national research in Brazil and other countries (Manaster & Havighurst, 1972; Havighurst & Gouveia, 1969). The SES index was calculated by assigning values for the levels of education and occupation from lowest to highest, multiplying the value for occupation by three and the value for education by two, and summing these two products. Three ordinal levels were then created from these scores representing low, middle, and high SES.

The questions regarding residence was seen as potentially important as a significant percentage of the Boa Vista population is said to be of recent migrants from other regions of Brazil. It was felt that in order to accurately interpret any regional differences in BDI scores, such immigrant makeup in the population may need to be taken into account.

Preliminary Analyses

Analyses of variance (ANOVAs) were used to test for differences across sample groups for age, number of children, number of children in household, and number of total

[5] Primary education in Brazil (fundamental) is roughly equivalent to elementary school in the U.S. Secondary education in Brazil (medio) is roughly equivalent to junior high and high school in the U.S. Tertiary education in Brazil (superior) is roughly equivalent to college or technical school in the U.S.

cohabitants in the household. In addition, chi-square analyses were used to test for frequency differences in gender, marital status, type of cohabitant, occupational status, household income, and SES index. Data of respondents from the nonclinical sample groups were then combined for subsequent analyses.

Method for Testing of Research Hypotheses

Hypothesis 1: Internal Consistency

Cronbach alpha correlations were calculated for both the clinical and nonclinical sample groups in order to assess the BDI's internal consistency in this population. Cronbach's coefficient alpha is used when the items on an instrument allow one to choose from more than two responses, as is the case with the BDI. For internal consistency to be considered "adequate," it has been suggested that the coefficient would need to be at least .70 (Kaplan & Saccuzzo, 1993).

Hypotheses 2-5: Demographics and the BDI

The data from the combined group of nonclinical respondents were used to test the hypotheses regarding demographic characteristics and BDI scores. ANOVAs were run with BDI scores across demographic levels to test the research hypotheses. A factorial design was used to examine each demographic variable with gender used as a constant independent variable. The alpha level was set conservatively to control for Type I error. It was expected that significant main effects would be found for gender and the other demographic variables tested. Specifically, females would have significantly higher scores than males; those self-identified as "indigenous" would have higher scores than those self-identified as "non-indigenous;" those within the lower levels of education,

income, occupational status, and SES would have significantly higher BDI scores than those within the higher levels of these variables; and adolescents would have significantly higher scores than those in any of the adult age groups.

The interrelationships among the demographic variables and the relationships between these variables and BDI scores were examined using Spearman rho correlation analysis. To test for unique variance among the predictor variables for BDI scores, a regression analysis was performed using the General Linear Model (GLM) function on SPSS. This method was chosen because unlike the traditional multiple regression analysis, GLM can incorporate ordinal variables without having to resort to dummy coding. Also, since GLM is an extension of the Analysis of Variance, it is robust to departures from normality. The GLM regression allows one to input categorical or ordinal variables as "fixed variables." At the same time, continuous variables can be entered as "covariates." Variables chosen in the present study were those that addressed the research hypotheses and showed significant relationships with BDI scores.

Variables chosen for the GLM model were entered simultaneously. To choose the best fitting model, variables were removed one at a time based on effect size value, and each subsequent model was then reassessed. The determination of "best" model was based on considerations of parsimony, statistical significance, overall variance explained, and model fit based on the ratio of adjusted $\underline{R}^2$ to ordinary $\underline{R}^2$ (adj $\underline{R}^2/\underline{R}^2$). The ratio adj $\underline{R}^2/\underline{R}^2$ has been supported for use in regression analysis to investigate the amount of "noise" (i.e. error) that accounts for variance explained by the model (Harrell, Lee, & Mark, 1996). If too much noise exists, it is likely that there is overfitting of the data, or

too many unnecessary or useless variables included in the model. Harrell and colleagues suggested that if adj R^2/R^2 falls below 0.85, then there is the possibility of overfitting. Given the best model, it was expected that gender, education, income, occupational status, and whether an individual was an adolescent or adult each would uniquely contribute to the variance on BDI scores.

Hypothesis 6: Criterion Validity

Criterion validity was assessed by comparing BDI scores between respondents who were diagnosed with depression (clinical group) and respondents who were not receiving any psychological or psychiatric treatment (nonclinical group). Demographic variables that were related to BDI scores in the nonclinical sample were compared between the two groups using chi-square analyses and *t* tests. Then the demographic variables that differed across groups were entered, along with clinical status, into an analysis of covariance (ANCOVA) using a GLM procedure.

Exploratory Analyses

Factor Analysis

Factor analysis was conducted for three nonclinical groups: the female sample, the male sample, and the combined sample of males and females. This was done as part of the research objective of assessing the psychometric properties of the BDI in this population. Factor analysis allows an examination of the underlying dimensionality of instruments that can aid in both interpreting the nature of symptom expression for a given population, as well in modifying the instrument for subsequent versions or adaptations. Males and females were examined separately because of past research showing that the

pattern of responses among the items may differ according to gender (e.g. Hammen & Padesky, 1977). The combined group was also examined in order to achieve the best estimate of the factor structure for the general population. Unfortunately, the present researcher was unable to recruit enough people to adequately test the hypothesis for the clinical respondents. Ideally, one should have at least five cases for each variable in the factor analysis (Hair, Anderson, Tatham, & Black, 1995). This would suggest a minimum sample size of 105 for the present study. As the clinical sample size was just 63, it was considered too small for conducting effective factor analysis.

A principal component analysis was used to derive the initial components. Observation of a list of studies provided by Beck, Steer, & Garbin (1988) suggests that the principle component method is one of the most common techniques used for examining the BDI's factor structure, especially for nonclinical student populations. As recommended in the literature (Hair et al., 1995), eigenvalues of 1.0 were used as a cutoff for selecting the components while examination of scree plots and component tables were conducted to aid in the decision of the final factor models. Resulting components were rotated using the varimax method in order to derive distinct factors. Varimax rotation was selected for its known ability to simplify the interpretation of factors (SPSS, 1999). Factor analysis was conducted using the covariance matrix of the BDI items rather than the correlation matrix. Schumacker and Lomax (1996) argued for the use of covariance matrices over correlation matrices for structural equation modeling, of which factor analysis is a special case. The assignment of items to factors in the final models was decided through the use of a loading cut-off point. A rule of thumb given has been to

consider a loading of ± .30 as meeting the minimal level for consideration and to consider a loading of ± .40 as "important" (Hair et al.). Therefore, considering practical significance, items that had loading values less than .35 on a given factor were not included with that factor in the final model.

Cross-Regional Comparisons

The BDI score mean of university students in this study was compared with BDI score means of university students from studies conducted in southern Brazil. Such analysis was conducted as a preliminary step in evaluating potential regional differences as a function of BDI scores. Comparison was done using multiple *t* tests with the alpha level set at a conservative level ($p < .01$) to control for type I error. Sample means of the other studies were from São Paulo (Gorenstein, Pompéia, & Andrade, 1995) and Porto Alegre (Cunha, Prieb, Touginha, & Goulart, 1996).

CHAPTER IV

RESULTS

Preliminary Analyses

Exclusions

Data from a total of 459 nonclinical participants and 77 clinical participants were gathered (Table 1). There were 138 nonclinical respondents and 13 clinical respondents who did not complete all items on the Beck Depression Inventory (BDI). As this was a substantial number, it was decided to keep the data of only those who had missed five items or less. If more than five items were missed, the BDI was considered invalid and the respondents' information was not used in further analysis. This included data from one clinical participant and 38 nonclinical participants. Chi-square and t-test analyses were performed to examine the demographic characteristics between those who had valid BDIs and those who had invalid BDIs. Results show that the groups did not differ in terms of gender or age, $?^2$ (1, N = 458) = .012, p = .913 and t(454) = .365, p = .715, respectively. However, those with invalid BDIs did have less income, t(436) = 2.42, p = .02 (see Table 2).

For the incomplete BDI items that remained in the study for any given respondent, the averages of the items that the respondent did complete were entered in the data. Substituting means for missing data was used since it is a conservative

Table 1

Distribution of Research Participants Recruited to Form the Nonclinical and Clinical Samples

Nonclinical Respondents:

Groups by Educational Level

Primary	n	Secondary	n	Tertiary	n	Miscellaneous	n
Night School Students	78	Magisterio Students	147	University Students	134	Military Students	15
				CEFAM Students	53	Baptist Church Members	7
						Technical School Students	18
						Teachers	6
						University Faculty	1

Clinical Respondents:

Clinic Type

General Hospital	n	Psychiatric Triage Center	n	Community Health Center	n
Hospital Geral de Coronel Mota	33	Secretaria da Administracão da Saude	31	Pricumã	7
				Pintolandia	6

Table 2

Respondents With Valid[a] BDIs vs. Respondents With Invalid BDIs: Means and Frequencies on Selected Demographic Variables

Variable		BDI Status: Valid	BDI Status: Invalid
Age		M = 26.2 SD = 8.8	M = 25.7 SD = 8.7
Income[b**]		M = 3.5 SD = 1.3	M = 3.0 SD = .94
Gender	Male	n = 151	n = 14
	Female	n = 269	n = 24
Ethnicity	Indigenous	n = 103	n = 7
	Non-indigenous	n = 303	n = 29

[a]Valid BDI is defined as less than six missing items

[b]Income is measured on a six-point scale based on household income ranges

** $p < .01$

technique that represents how the person most likely would have answered the item if further encouraged to do so (Tabachnick & Fidell, 1996). Examination of the missing data revealed no clear pattern among the items (Table 3); in fact, all items were missed at about the same low rate, from .5% to 2.3%. Exceptions included Items 4 (dissatisfaction), 10 (crying), and 19 (weight loss) which, among the nonclinical respondents, had missing

Table 3

Number and Percentage of Cases With Missing Data on BDI Items for Respondents With Valid[a] BDIs (N = 420)

	Nonclinical		Clinical	
Item	# Missing[b]	%age	# Missing[b]	%age
BDI 1	7	1.8	0	.0
BDI 2	9	2.3	0	.0
BDI 3	7	1.8	0	.0
BDI 4	14	3.6	1	1.6
BDI 5	6	1.5	0	.0
BDI 6	9	2.3	1	1.6
BDI 7	5	1.3	1	1.6
BDI 8	3	.8	0	.0
BDI 9	7	1.8	0	.0
BDI 10	12	3.1	0	.0
BDI 11	6	1.5	0	.0
BDI 12	6	1.5	1	1.6
BDI 13	3	.8	0	.0
BDI 14	6	1.5	0	.0
BDI 15	7	1.8	0	.0
BDI 16	2	.5	0	.0
BDI 17	2	.5	1	1.6
BDI 18	9	2.3	0	.0
BDI 19	17	4.4	2	3.2
BDI 20	6	1.5	0	.0
BDI 21	8	2.1	1	1.6

[a]"Valid" BDIs in this study were those that had no more than five missing items.

[b]Figures represent the number of cases missing each item.

data rates of 3.6%, 3.1%, and 4.4%, respectively. Although these rates are still low, it is of interest that they were missed with substantially higher frequency than the other items.

The most missed item in the nonclinical samples (4.4%), Item 19 (weight loss), was also the most missed in the clinical samples (3.2%).

The number of items that each respondent missed was also examined. Table 4 shows the percentage of cases with missing items on the BDI for the nonclinical and clinical groups. As can be seen, most did not have any missing items (77% of nonclinical respondents and 89% of clinical respondents). For the nonclinical respondents who had incomplete BDIs, the majority missed only one item (62%) followed by 22% who had missed two items. Those who had missed three, four, or five items were relatively few (7%, 3%, and 6%, respectively). For the clinical respondents who had incomplete BDIs,

Table 4

Frequency and Percentage of Cases by Number of Missed BDI Items for Those With Valid[a] BDIs (N = 420)

	Nonclinical		Clinical	
# of Missed Items	Frequency	Percentage	Frequency	Percentage
0	301	77.2	56	88.9
1	55	14.1	6	9.5
2	20	5.1	1	1.6
3	6	1.5	0	.0
4	2	.5	0	.0
5	6	1.5	0	.0

[a]"Valid" BDIs in this study were those that had no more than five missing items

no one had missed more than three items, and the majority had only missed one item (75%). Given the low rates of missing items and the fairly consistent frequency of cases

with missing data across items, it was felt that including this data with imputed averages would not compromise the integrity of subsequent analyses.

The data from the clinical respondents were examined to determine whose information would remain in the final analyses. Only patients diagnosed with depression (dysthymia, major depression, unspecified) were maintained, leaving a sample size of 64. The other 12 respondents included patients diagnosed with anxiety disorders, bipolar disorder, adjustment disorder, and others. Although it was originally planned that only patients who completed the materials within 72 hours of their initial contact with treatment would be included in the analysis, it was decided that data from patients who were in treatment longer would also be used. Excluding these cases would have left a sample size of 35, which was considered just short of minimum sample size to conduct effective analyses. In order to confirm whether including the data from longer treated patients would compromise the study, BDI scores were compared between these patients and the patients who had recently started treatment. Unexpectedly, it was found that the longer treated patients actually had a higher average BDI score than the more recent patients. However, this difference was not found to be significant, $t(62) = 1.67$, $p = .10$. Therefore, all 64 patients were used for this study. Examining the age frequencies of this final group revealed that all respondents were 18 or older except one patient of 14 years. This participant's data was excluded from further analysis so that only adults remained in the sample in order to simplify interpretation. Therefore, the final clinical sample size was 63.

Data from nonclinical participants were also examined to determine whose data would be included in the study. There were 18 respondents who indicated that they were currently receiving treatment for emotional problems, either through medication and/or therapy. The data from these respondents were excluded in order to maintain a truly nonclinical group. Examination was conducted for the age distribution of the remaining 394 participants. Just about all ages were represented from age 14 to age 50. The only respondents above the age of 50 were two individuals with ages of 66 and 68. They were treated as outliers and excluded from the study. Two other respondents did not report age and thus were excluded. The final sample size used for the nonclinical group in this study was 390.

Demographics

The clinical and nonclinical groups were examined in terms of demographics. Data for the clinical respondents were gathered from various state-run medical centers (see Table 5). The majority of patients were either from a hospital near the city center or from a triage department of a medical administrative building north of the city center. The remaining data was gathered from both a community health center in the city "suburbs," and a community health center near the outskirts of the city. Each gender was fairly well represented, with 25 male patients and 38 female patients. Age was adequately distributed, with a mean of 34.0 (SD = 11.36) and a range from 18 to 66. Ages above 45 tended to be less represented than those between 18 and 45. Approximately half of the clinical respondents were married (50.8%), a third were single (28.6%), and a fifth were

Table 5

Composition of Clinical Sample Used to Test the Research Hypotheses

Clinic Type					
General Hospital	n	Psychiatric Triage	n	Community Health Center	n
Hospital Geral de Coronel Mota	22	Secretaria da Administracão da Saude	31	Pricumã	5
				Pintolandia	5

either widowed, divorced, or separated (1.6%, 7.9%, and 11.1%, respectively). Those who were married were living with their spouse, whereas nearly a fifth were living with their parents (17.5%), another fifth with "others" (22.2%), and a tenth were living alone (9.5%). Nearly all clinical respondents considered themselves "non-indigenous" (90.5%). About a fifth had immigrated to the area within the previous three years (19%). Regarding socioeconomic factors, the three levels of all variables were fairly well represented. About a fifth had low income (19%), another fifth had high income (17.5%), and a little more than half had middle income (63.5%). The same proportional pattern was found for education (22.2%, 23.8%, and 54%) and occupational status (14.3%, 20.6%, and 55.6%). In contrast, a combination of both education and occupational status into a socioeconomic (SES) index exhibited fairly equal representation among the levels (25.4%, 30.2%, and 34.9%).

Nonclinical respondents were gathered from several sample groups (see Table 6). Among the nonclinical respondents, there were 121 university students, 45 CEFAM students, 55 night school students, 128 magisterio students, and 41 miscellaneous nonclinical respondents. There were more female nonclinical respondents than male respondents (63.8% and 35.9%, respectively). About half of the respondents were single (49.2%), and slightly less than half were married (44.9%). The few remaining were either widowed, divorced, or separated (5.6%). Approximately two-fifths of the respondents were living with their spouse (40.8%), a little more than a third with their parents (34.1%), slightly less than a fifth with other people (17.7%), and relatively few were

Table 6

Composition of Nonclinical Sample Used to Test the Research Hypotheses

Groups by Educational Level							
Primary	n	Secondary	n	Tertiary	n	Miscellaneous	n
Night School Students	55	Magisterio Students	128	University Students	121	Military Students	15
				CEFAM Students	45	Baptist Church Members	5
						Technical School Students	15
						Teachers	5
						University Faculty	1

living alone (6.4%). The proportion of nonclinical respondents who identified themselves as indigenous was 23.6%, compared with 72.8% who identified themselves as non-indigenous. Fourteen respondents refused to provide this ethnic information (3.6%). A small minority had recently immigrated to the area within the previous three years (15.9%).

Age groups were created so that more detailed examination of the relationship between age and other variables could be performed. To ensure that there would be adequate numbers within each age level, cutoff scores for the age groups were determined by utilizing the age distribution of the combined nonclinical sample. This resulted in roughly equal representation among the age groups. About a fifth of the respondents were from ages 14 to 18 (21.8%), another fifth were from ages 19 to 22 (20.5%), a little more than a fifth were from ages 23 to 28 (24.9%), slightly less than a fifth were from ages 29 to 35 (17.9%), and a little less than this were from ages 36 to 50 (14.9%).

Regarding socioeconomic factors, respondents tended to cluster around the middle levels for both household income and occupational status. About a fifth of the nonclinical respondents had low income (19.2%), another fifth had high income (22.6%), and a little over half had middle income (54.9%). For occupational status, less than a fifth had low occupational status (15.6%), even less had high occupational status (13.1%), and over a half had mid occupational status (58.7%). By contrast, the distribution shifted towards the high end for education. Nearly a half of the nonclinical respondents were in the high education level (47.7%), over a third in the middle education level (36.9%), and

less than a fifth were in the low education level (15.4%). Likewise, on the SES index, 43.8% were classified in the high level, 24.6% in the mid level, and 15.4% in the low level.

To better understand the makeup of these groups, the nonclinical samples were compared according to the variables being used in this study. Analyses of variance (ANOVAs) were used to test for differences across sample groups for age, number of children, number of children in household, and number of total cohabitants in the household. In addition, chi-square analyses were used to test for frequency differences in gender, marital status, type of cohabitant, ethnicity, occupational status, household income, and SES index.

Results are presented in table 7. No significant difference was found for ethnicity, $?^2(4, N = 376) = 6.73, p = .515$. However, significant differences were found for all other demographic variables, including age ($F[4, 385] = 40.21, p < .001$), number of children ($F[4,326] = 7.01, p < .001$), number of children in the household ($F[4,309] = 8.07, p < .001$), total number of cohabitants ($F[4,377] = 12.98, p < .001$), gender ($?^2[4, N = 389] = 31.48, p < .001$), marital status ($?^2[8, N = 389] = 22.18, p = .005$), type of cohabitant ($?^2[12, N = 386] = 50.59, p < .001$), occupational status ($?^2[8, N = 327] = 62.25, p < .001$), household income ($?^2[8, N = 377] = 135.54, p < .001$), and SES index ($?^2[8, N = 327] = 348.04, p < .001$). In general, night school and magisterio students were younger, less educated, from poorer households, had occupations of lower status, were more likely to be single and live with their parents, less likely to have children, and had more cohabitants in the household than the other sample groups. Night school students had a

greater proportion of males to females while the other sample groups had a greater proportion of females to males.

Table 7

Means and Proportions of Selected Demographic Variables by Nonclinical Sample Group

	Nonclinical Sample Group				
Variable	University	CEFAM	Magisterio	Night School	Miscellaneous
Age***	M = 28.7 SD = 7.5 N = 121	M = 32.0 SD = 7.4 N = 45	M = 21.8 SD = 12.8 N = 128	M = 20.3 SD = 6.3 N = 55	M = 31.9 SD = 8.3 N = 41
Number of Children***	M = 1.2 SD = 1.2 N = 107	M = 1.9 SD = 1.2 N = 40	M = 0.9 SD = 1.2 N = 97	M = 0.9 SD = 1.8 N = 53	M = 1.9 SD = 1.6 N = 34
Number of Children in the Household***	M = 0.9 SD = 1.1 N = 104	M = 1.6 SD = 1.2 N = 37	M = 0.8 SD = 1.2 N = 90	M = 0.6 SD = 1.1 N = 50	M = 1.7 SD = 1.5 N = 33
Number of Cohabitants in Household***	M = 3.8 SD = 1.8 N = 119	M = 4.0 SD = 1.6 N = 44	M = 5.2 SD = 2.2 N = 127	M = 6.3 SD = 3.9 N = 52	M = 4.4 SD = 1.7 N = 40
Gender***					
Male	37.2%	13.3%	27.0%	63.6%	41.5%
Female	62.8%	86.7%	70.9%	36.4%	58.5%
	N = 121	N = 45	N = 127	N = 55	N = 41
Ethnicity[a]					
Indig.	28.8%	33.3%	23.2%	16.3%	15.4%
Nindig.	71.2%	66.7%	76.8%	83.7%	84.6%
	N = 118	N = 45	N = 125	N = 49	N = 39

MaritalStatus**					
Single	45.5%	24.4%	60.6%	56.4%	43.9%
Married	50.4%	68.9%	33.1%	38.2%	48.8%
Other	4.1%	6.7%	6.3%	5.5%	7.3%
	N = 121	N = 45	N = 127	N = 55	N = 41
Cohabitant***					
Spouse	49.6%	68.9%	27.2%	27.8%	46.3%
Parents	24.0%	6.7%	50.4%	48.1%	29.3%
Alone	8.3%	11.1%	3.2%	7.4%	4.9%
Others	18.2%	13.3%	19.2%	16.7%	19.5%
	N = 121	N = 45	N = 125	N = 54	N = 41
Income***					
Low	7.6%	0.0%	28.7%	57.4%	0.0%
Middle	57.1%	86.0%	61.5%	37.0%	35.9%
High	35.3%	14.0%	9.8%	5.6%	64.1%
	N = 119	N = 43	N = 122	N = 54	N = 39
Occupation***					
Low	6.7%	0.0%	20.2%	47.5%	5.4%
Middle	68.6%	85.4%	68.3%	45.0%	59.5%
High	24.8%	14.6%	11.5%	7.5%	35.1%
	N = 105	N = 41	N = 104	N = 40	N = 37
SES***					
Low	0.0%	0.0%	20.2%	92.5%	5.4%
Middle	6.7%	0.0%	68.3%	7.5%	40.5%
High	93.3%	100.0%	11.5%	0.0%	54.1%
	N = 105	N = 41	N = 104	N = 40	N = 37

Note: Mean differences were tested across sample groups using univariate ANOVAs. Differences in proportions of frequency across sample groups was tested using the chi-square statistic. Casewise deletion due to missing values resulted in sample sizes varying depending on the demographic variable assessed. Sample sizes are reported in each cell.

[a]Indig. = Indigenous (self-identified), Nindig. = Non-indigenous (self-identified).

* p< .05 ** p < .01 *** p < .001

Sample groups were compared across age groups in terms of number of respondents within each level to examine age distributions. The means within each age group and sample group are presented in Table 8. Only 7.4% of university students, 2.4% of the miscellaneous nonclinical participants, and none of the CEFAM students fell within the "14 to 18" age group. This is contrasted with 50.9% of night school students and 36.7% of the magisterio students. Therefore, almost all adolescents used in this study were from either the night school or from the magisterio school. The night school and

Table 8

Proportions of Respondents by Age Group and Nonclinical Sample Group.

	Sample Groups				
Age Group	University (N = 121)	CEFAM (N = 45)	Magisterio (N = 128)	Night School (N = 55)	Miscellaneous (N = 41)
14 to 18	7.4%	0.0%	36.7%	50.9%	2.4%
19 to 22	14.0%	0.0%	34.4%	29.1%	7.3%
23 to 28	32.2%	46.7%	12.5%	12.7%	34.1%
29 to 35	24.0%	28.9%	12.5%	3.6%	24.4%
36 to 50	22.3%	24.4%	3.9%	3.6%	31.7%

magisterio students generally fell under the younger age groups, which ranged from 14 to 22 years, whereas the university students, CEFAM students, and miscellaneous participants generally fell under the older age groups, which ranged from 23 to 50.

Testing the Research Hypotheses

Hypotheses 1: Internal Consistency

The first research hypothesis, that adequate internal consistency would be found among the BDI items for both nonclinical and clinical samples, was supported. The reliability of the BDI was examined using Cronbach coefficient alpha ($r_?$) for both the nonclinical sample groups and the clinical group. All correlations were high, indicating adequate reliability. The highest coefficients were for the clinical group ($r_?$ = .90), CEFAM students ($r_?$ = .90), and night school students ($r_?$ = .91). The magisterio students, university students, and miscellaneous nonclinical respondents showed slightly lower levels of consistency among items ($r_?$ = .84, $r_?$ = .85, and $r_?$ = .85, respectively). The fact that high coefficients are found for all sample groups suggests that the BDI is internally reliable for this Brazilian population across various age and SES levels.

Hypotheses 2-5: Demographics and the BDI:

Research hypotheses 2 through 5 dealt with relationships between BDI scores and certain demographic variables. The second research hypothesis was that females were expected to have higher BDI scores than males in all nonclinical samples. The third research hypotheses was that for nonclinical respondents, BDI scores were expected to differ as a function of educational, income, and occupational status levels in an inverse direction. Specifically, those with a lower education level, lower income, and a lower

occupational status would have higher scores than those with higher levels of these variables. The fourth research hypothesis was that for nonclinical respondents, adolescents were expected to have higher BDI scores than adults. Finally, the fifth research hypothesis was that for nonclinical respondents, participants who identified themselves as "indigenous" were expected to have higher BDI scores than those who identified themselves as "non-indigenous."

To test the above hypotheses, ANOVAs were run to test for BDI score differences across demographic levels for the nonclinical participants. The means and standard deviations for each variable level are presented in Table 9. Multiple analyses with factorial designs were used on the combined nonclinical sample. The alpha level was set at .01 to control for Type I error. Gender was used as a constant independent variable.

Table 9

Analysis of Variance Testing BDI Mean Differences Across Gender and Other Selected Demographic Variables Within the Combined Nonclinical Sample

Source	df	F	eta^2
Gender (G)	1	13.50**	.034
Age Group (A)	4	9.98**	.095
G x A	4	1.72	.018
Error	379		
Gender (G)	1	12.84**	.032
Education (E)	2	17.03**	.082
G x E	2	.11	.001
Error	383		

Gender (G)	1	5.40	.014
Income (I)	2	7.25*	.038
G x I	2	.78	.004
Error	371		
Gender (G)	1	4.36	.013
Occupation (O)	2	5.89*	.036
G x O	2	.98	.006
Error	320		
Gender (G)	1	11.00*	.033
SES (S)	2	11.77**	.069
G x S	2	.38	.006
Error	320		
Gender (G)	1	6.78	.018
Ethnicity (ET)	1	.46	.001
G x ET	1	.23	.001
Error	371		

*$\underline{p} < .01$. **$\underline{p} < .001$

Testing for differences across age group and gender using a 2 x 5 ANOVA revealed a significant main effect for both age group and gender. Females had significantly higher BDI scores than males. There was no significant interaction effect between gender and age group. A post-hoc comparison was conducted using Tukey's honestly significant difference (HSD) test to examine the differences in BDI scores across age groups (see Table 10). The test revealed that scores were significantly higher in the "14 to 18" age group than in all other groups except for the "19 to 22" age group. No other significant differences between age groups were found. The "19 to 22" age group appeared to have significantly higher scores than the "36 to 50" age group, though

this difference failed to reach significance at the .01 level (p = .034). Taken together, the findings are consistent with the hypothesis that adolescents would have higher BDI scores compared to adults.

Tests for differences in BDI scores using a 2 x 3 factorial design with gender and SES factors as independent variables were conducted. There were significant main effects for occupation, income, education, and SES index. Results showed no significant

Table 10

Means and Standard Deviations for BDI Scores by Category of Selected Demographic Variables Within the Combined Nonclinical Sample

Variable	M	SD	N
Gender			
Male	10.5[a]	8.4	140
Female	13.3[b]	9.6	249
Age Group			
14 – 18	16.6[a]	10.9	85
19 – 22	13.6	8.7	80
23 – 28	10.2[b]	6.4	97
29 – 35	10.9[b]	9.3	70
36 – 50	9.3[b]	9.0	58
Education			
Low	17.4 [a]	12.5	60
Middle	12.3 [b]	8.4	144
High	10.6 [b]	8.1	186

Income			
Low	14.9 [a]	10.8	75
Middle	12.5	8.7	214
High	9.8 [b]	8.4	88
Occupation			
Low	15.8 [a]	11.5	49
Middle	11.6 [b]	8.7	218
High	10.0 [b]	7.6	60
SES			
Low	16.3 [a]	12.2	60
Middle	12.0 [b]	8.0	96
High	10.3 [b]	7.9	171
Ethnicity			
Indigenous	13.0	9.0	92
Non-indigenous	11.8	9.1	284

Note: For each variable, means for categories that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison. Means with no subscript showed no significant differences with the other means.

interaction effects between gender and any of the SES variables. Examination across the variable levels using Tukey's HSD showed that for occupational status, education, and SES index, those in the lowest levels had higher BDI scores than those in the middle or high levels (see Table 10). For income, the same result was found, but only between the low and high levels. In none of the cases did the middle level significantly differ from the high level. The results support the hypothesis that BDI would be higher for those with lower SES in terms of occupation, income, and educational level.

A 2 x 2 ANOVA was run with gender and ethnicity (indigenous versus non-indigenous) as independent variables to test the hypothesis that those who self-identified as indigenous would have higher BDI scores than those who self-identified as non-indigenous. The test revealed no significant main effect for ethnicity, nor interaction effect between the variables.

The relationships among the demographic variables and BDI scores were examined within the combined nonclinical sample. The interrelationships among the demographic variables and the relationships between these variables and BDI scores were first examined using a Spearman rho correlation analysis. The results for the correlations between the demographic variables and BDI scores are presented in Table 11. BDI correlated most strongly with age, followed by education, income, SES index, and occupational status. In the combined nonclinical sample, younger age, lower education,

Table 11

Spearman Rho Correlation Analysis Comparing Demographic Characteristics With BDI Scores

Variable	r_s	N[a]
Age	-.28**	390
Number of Children	-.06	331

Number of Children in the Household	-.06	314
Number of Cohabitants in the Household	.04	382
Income	-.19**	377
Occupational Status	-.15**	327
Education	-.20**	390
Years of Residence	.06	382
SES Index	-.19**	327

[a]Sample sizes differed depending on variables analyzed. Cases were excluded from analysis when data for the demographic variable were missing.

* $\underline{p} < .05$ ** $\underline{p} < .01$

lower occupational status, lower income, and lower SES index scores were related to higher BDI scores. The intercorrelations among the demographic variables that significantly correlated with BDI scores are presented in Table 12. As can be seen, all of the demographic variables significantly correlated with each other. Those who were older had more education, higher occupational status, more household income, and higher SES index values. All SES variables were correlated with each other in a positive direction, as expected.

Table 12

Intercorrelations Between Demographic Variables That Were Significantly Correlated With BDI Scores

Variable	1	2	3	4	5
1. Age	--	.28** (377)	.30** (327)	.50** (390)	.50** (327)
2. Income		--	.36** (317)	.45** (377)	.49** (317)
3. Occupational Status			--	.32** (327)	.61** (327)
4. Education				--	.88** (327)
5. SES					--

Note: Correlation values are Spearman rho coefficients. The values underneath in parentheses are the number of cases used to calculate each coefficient. Cases were excluded from analysis when data for either demographic measure were missing.

* $p < .05$ ** $p < .01$

To test for unique variance among the predictor variables for BDI scores, a regression analysis was performed using the General Linear Model (GLM) function on SPSS. Variables chosen for entrance into the models were those that addressed the research hypotheses and showed significant relationships with BDI scores either through ANOVA or Spearman rho analysis. These variables included the SES measures (income, occupational status, educational level), gender, and "adolescent versus adult." Age as a continuous variable was always entered as a covariate in the regression models because of its relatively high correlations with all other variables involved, especially with education. An exception was when the variable "adolescent vs. adult" was entered. In this latter case, the exclusion of age as a covariate was necessary to avoid redundancy among the predictor variables. As the SES index was a product of both education and occupational status, it was not included in the analysis in order to avoid redundancy with education or occupation.

Due to missing data on variables used in the GLM regression analysis, 73 cases were excluded, leaving a sample size of 317. Models were compared by evaluating effect sizes for the variables and the entire model, assessing the model fit, and looking at the results of the significance tests. Tests of significance were based on the differences in BDI scores across group means after the means were adjusted for the variance accounted by other variables in the model.

Initially, gender and three SES variables (income, occupational status, and education) were entered into the GLM model. The results of this first model are presented

in Table 13. Results revealed that BDI scores differed significantly for gender ($F[1,308] = 15.56$, $p < .001$) and education ($F[2,308] = 3.95$, $p = .020$), but did not differ significantly for income ($F[2,308] = 1.37$, $p = .256$) or occupational status ($F[2,308] = 1.29$, $p = .278$). The combination of these variables accounted for 12.4% of the variance of BDI scores when age was statistically controlled for. However, examination of the ratio of adjusted R^2 to ordinary R^2 showed evidence of overfitting (adj $R^2/R^2 = 0.82$).

Table 13

Summary of Regression Analysis (GLM) for Variables Predicting BDI Scores in the Combined Nonclinical Sample Using Age as a Covariate: Model 1

(N = 317)

Variable	df	F	? 2
Gender	1	15.56***	.048
Education	2	3.95*	.025
Income	2	1.37	.009
Occupational Status	2	1.29	.008
Age	1	2.21	.007
Error	308		

Note. $R^2 = .124$ (Adjusted $R^2 = .102$)

* $p < .05$ ** $p < .01$ *** $p < .001$

A second model was run, this time excluding occupational status given that it showed the smallest effect size in the first model ($?^2$ = .008). The results of this model are shown in Table 14. The amount of variance explained by the corrected model decreased slightly over the previous model (11.7%). However, there was evidence of

Table 14

Summary of Regression Analysis (GLM) for Variables Predicting BDI Scores in the Combined Nonclinical Sample Using Age as a Covariate: Model 2

(N = 317)

Variable	df	F	$?^2$
Gender	1	16.33***	.050
Education	2	5.47**	.034
Income	2	1.52	.010
Age	1	3.06	.010
Error	310		

Note. R^2 = .117 (Adjusted R^2 = .100)

* $p < .05$ ** $p < .01$ *** $p < .001$

improvement in the model's fit (adj R^2/R^2 = 0.85). Again, for gender and education there were significant differences in BDI scores, $F(1,310) = 16.33$, $p < .001$ and $F(2,310) =$

5.47, p = .005. For income, however, no significant difference was found, F(2,310) = 1.52, p = .221.

A third model was run that excluded income. The results of the model are presented in Table 15. The combination of gender and education alone, when

Table 15

Summary of Regression Analysis (GLM) for Variables Predicting BDI Scores in the Combined Nonclinical Sample Using Age as a Covariate: Model 3

(N = 317)

Variable	df	F	? 2
Gender	1	17.63***	.053
Education	2	6.72**	.041
Age	1	4.28*	.014
Error	312		

Note. R^2 = .108 (Adjusted R^2 = .097)

* p < .05 ** p < .01 *** p < .001

controlled for age, explained 10.8% of the variance in BDI scores. This, again, was slightly less than the variance explained by the other models. However, further examination revealed this to be the model with the best fit (adj R^2/R^2 = 0.90). Both gender and education showed significant differences in BDI scores, F(1,384) = 19.04, p

<.001 and F(2, 384) = 11.88, p <.001. In all, this last model was judged to be the best one for predicting BDI scores.

Another series of regression models were run to examine the possible effects of interactions on predicting BDI scores. Gender, education, and age were again entered into the model along with all interactions. All models examined in this series are presented in Appendix A. Table 20 shows step five in the regression. Here we can see that education, age, and the three-way interaction between gender, education, and age

Table 20[a]

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores in the Combined Nonclinical Sample Using Age as a Covariate: Model 5 (N = 317)

Variable	df	F	? 2
Education (E)	2	5.04**	.032
Age (A)	1	9.03**	.028
G x E x A	5	4.99***	.075
Error	308		

Note. R^2 = .129 (Adjusted R^2 = .106)

[a]Models 1 – 8 can be found in Appendix A: Tables 16 – 23

* p < .05 ** p < .01 *** p < .001

each explained a significant portion of the variance in BDI scores. However, there was evidence that including the three-way interaction in the model led to overfitting of the data (adj $R^2/R^2 = 0.82$). Therefore, this interaction was taken out and gender was reintroduced in the model at the step when it was initially removed. Removing the three-way interaction and following the same steps as before resulted in the same model as in the previous series (Table 23). Gender, education, and age each explained a significant amount of the variance in BDI scores. Further, no interaction effect between the predictor variables significantly added to the model.

Table 23

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 8 (N = 317)

Variable	df	F	? 2
Gender (G)	1	17.63***	.053
Education (E)	2	6.72**	.041
Age (A)	1	4.28*	.014
Error	312		

Note. $R^2 = .108$ (Adjusted $R^2 = .097$)

* $p < .05$ ** $p < .01$ *** $p < .001$

A final series of models were run that included the variable "adolescent vs. adult" as a predictor variable and excluded age as a covariate. Although "adolescence vs. adulthood" is a discrete measure of age and including a continuous measure of a variable is argued as preferable to including a discrete measure when predicting outcomes (Harrell, Lee, & Mark, 1996), the replacement of age with "adolescent vs. adult" was done for an important reason. Age as a continuous variable was correlated negatively with BDI scores in our sample; however, the relationship did not appear to be uniform across the age span. As hinted previously, examination of the means of BDI scores across age groups showed that the decrease of scores from adolescence to adulthood appeared to level off at the "23 to 28" age group (see Table 10). Therefore, a categorical measure of adult status perhaps would capture more accurately the relationship of age on BDI scores in a linear regression model than would age as a continuous variable. In addition, it would tie in more directly to testing the hypothesis that adolescents would have higher scores than adults.

The initial model included gender, education, and "adolescent vs. adult," as well as all interactions among these variables. The series of models are presented in the appendix. Table 27 shows the final model. As can be seen, gender, education, "adolescent vs. adult," and the interaction between gender and "adolescent vs. adult" each accounted for a significant amount of variance in BDI scores. The corrected model explained about 13.5% of the variance in BDI scores. The model also appeared to adequately fit the data ($\underline{R}^2/\underline{R}^2 = 0.90$). Examination of effect sizes for each variable showed that gender

explained somewhat more of the variance in BDI scores than the other predictor variables, although all effect sizes were relatively small.

Table 27[a]

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores in the Combined Nonclinical Sample Using Age as a Dichotomous Variable: Model 4 (N = 317)

Variable	df	F	? 2
Gender (G)	1	22.45***	.067
Education (E)	2	5.52**	.034
Adolescent vs. Adult (AD)	1	7.19**	.023
G x AD	1	4.71*	.015
Error	311		

Note. R^2 = .135 (Adjusted R^2 = .121)

[a]Models 1 – 4 can be found in Appendix A: Tables 24 - 27

* $p < .05$ ** $p < .01$ *** $p < .001$

When age was measured as a discrete variable (categorizing cases as adolescent or adult), the best model showed that gender and education continued to account for unique variance in BDI scores. Whether a person was an adolescent or adult, and the

interaction between this and gender, also added significantly to this predictive model of BDI scores.

The BDI means for gender by age status (adolescent vs. adult) are presented in Table 28. As can be seen, it appears that the difference in BDI scores across gender was

Table 28

BDI Means for Gender by "Adolescent vs. Adult" in the Combined Nonclinical Sample

	Age Status	
Gender	Adolescent	Adult
Male	M = 13.3 SD = 9.1	M = 9.3 SD = 7.8
Female	M = 19.6 SD = 11.7	M = 12.0 SD = 8.6

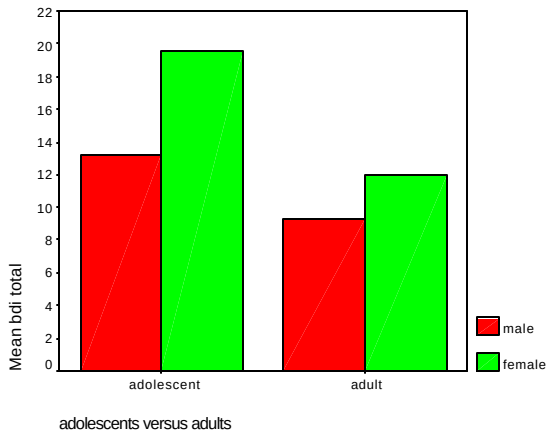

Figure 1. BDI means for gender by "adolescent vs. adult" in the combined nonclinical sample.

greater in adolescents than in adults. This can more clearly be seen in Figure 1. Thus, for the samples studied, being an adolescent seemed to have strengthened the effect of gender on BDI scores.

Hypothesis 6: Criterion Validity

The sixth research hypothesis was that those who were diagnosed with clinical depression would have higher BDI scores than nonclinical respondents. This hypothesis was tested by comparing BDI scores between adult respondents who were diagnosed with depression (clinical group) and adult respondents who were not receiving any psychological or psychiatric treatment (nonclinical group). Adolescents, as defined as those 18 years old or younger, were not used in this analysis since not enough adolescents were represented in the clinical sample to make an adequate assessment for this age cohort. Removing adolescents left a sample size of 60 for the clinical sample, and a sample size of 305 for the nonclinical sample. Chi-square analysis showed that the groups did not differ in terms of gender. However, clinical respondents were older (M = 34.8, SD = 11.1) than nonclinical respondents (M = 28.6, SD = 7.6), t (363) = 5.32, p < .001). In terms of SES factors, the groups did not differ in occupational status or income level, but did differ in educational level, with nonclinical respondents being more represented in the high educational level, ?²(2, N = 365) = 22.8, p < .001. Therefore, in order to test for differences in BDI scores across groups, a 2 x 3 ANCOVA was run using the GLM approach to take into account the influences of education and age on BDI scores. BDI means were simultaneously tested across clinical status and education level using age as a covariate.

The results of the ANCOVA are presented in Table 29. There were significant differences found for clinical status and the interaction between education and clinical status. Observation of the means (Table 30) revealed that scores were higher for the clinical respondents than for nonclinical respondents for each education level. When

Table 29

Analysis of Covariance: Comparing BDI Scores of Clinically Depressed Adults and Nonclinical Adults

Source	df	F	eta^2
Clinical Status (C)	1	109.00***	.233
Education (E)	2	.09	.001
Age[a]	1	1.13	.003
C x E	2	3.78*	.021
Error	358		

[a]Age is used as a covariate.

* $p < .05$ ** $p < .01$ *** $p < .001$

looking at means across education level within each clinical status group, it appeared that for clinical respondents, BDI means increased with higher education level, while for nonclinical respondents, BDI means decreased with higher education level.

Table 30

BDI Means for Clinical Status by Education Level in the Combined Nonclinical Sample

	Clinical Status	
Education Level	Clinical	Nonclinical
Low	M = 24.3 SD = 10.9	M = 15.8 SD = 10.6
Middle	M = 28.0 SD = 12.9	M = 11.0 SD = 7.9
High	M = 28.3 SD = 7.9	M = 10.3 SD = 8.0

Exploratory Analyses

Factor Analysis

Factor analysis was conducted for three nonclinical groups: the female sample, the male sample, and the combined sample of males and females. As mentioned in the method section, the clinical group was not used in analysis because the sample size was too small for conducting effective factor analysis.

Exploratory factor analysis was run using SPSS 10.0. Examination of the correlation matrix was conducted using the Kaiser-Meyer-Olkin measure of sampling adequacy (MSA) and the Bartlett test of sphericity. The Bartlett test provides the statistical probability that at least some of the items will have significant correlations among each other, which is necessary for finding factors within the scale. The MSA is

Table 31

Measures to Determine Appropriateness of Samples for Use in Factor Analysis

Sample	Bartlett Test of Sphericity[a]	Measure of Sampling Adequacy
Combined	2193.1*	.93
Female	1590.4*	.92
Male	838.0*	.81

[a]Numbers represent approximate chi-square values based on 210 degrees of freedom.

* $p < .001$

another measure of testing whether the sample is appropriate for factor analysis. Generally accepted guidelines for the MSA are that .90 or above is "marvelous" and .80 or above is "meritorious," while below .50 for the MSA is "unacceptable" (Kaiser, 1970). As can be seen in Table 31, values of these indices revealed that the nonclinical combined sample as well as the nonclinical male and female samples had adequate properties for effective factor analysis.

Principle component analysis for the combined nonclinical sample revealed a five-factor model. Although only the first two components had eigenvalues above 1.0, examination of the scree plot (Figure 2) showed that the first five components each would probably explain a significant amount of unique variance. Varimax rotation of these five components revealed two distinct factors and three factors represented by only one item each (see Table 32). The first factor, accounting for 18% of the total variance, consisted

of nine items (1-5, 7-9, 13): mood, pessimism, sense of failure, lack of satisfaction, guilt feelings, self-dislike, self-accusation, suicidal wishes, and indecision. The second factor, accounting for 14% of the total variance, also consisted of nine items (12-18, 20-21): social withdrawal, indecisiveness, distortion of body image, work inhibition, sleep disturbance, fatigability, loss of appetite, somatic preoccupation, and loss of libido. The first factor was made up of mainly items reflecting cognitive and affective aspects of depression, whereas the second factor consisted of mainly items reflecting somatic concerns and performance difficulties. One item, indecision, loaded significantly on both factors. The remaining three factors, together accounting for 17% of the total variance,

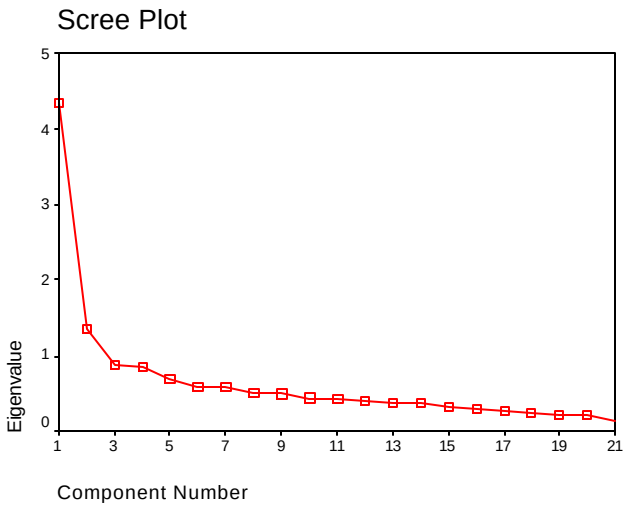

Figure 2: Scree plot of the principal component analysis for the nonclinical combined sample.

Table 32

Rotated Component Matrix for the Combined Nonclinical Sample

BDI Items	Components				
	1	2	3	4	5
(Bdi8) self-accusation	.776				
(Bdi3) sense of failure	.663				
(Bdi2) pessimism	.628				
(Bdi5) guilt feelings	.599				
(Bdi4) lack of satisfaction	.573				
(Bdi7) self-dislike	.556				
(Bdi1) mood	.486				
(Bdi9) suicidal wishes	.468				
(Bdi21) loss of libido		.657			
(Bdi13) indecisiveness	.428	.614			
(Bdi16) sleep disturbance		.604			
(Bdi14) distortion of body image		.574			
(Bdi17) fatigability		.508			
(Bdi20) somatic preoccupation		.400			
(Bdi15) work inhibition		.393			
(Bdi18) loss of appetite		.390			
(Bdi12) social withdrawal		.388			
(Bdi6) sense of punishment			.930		
(Bdi19) weight loss[a]					
(Bdi11) irritability				.969	
(Bdi10) crying					.933

Note. The matrix is based on results of Varimax Rotation using a Principle Component Analysis extraction method (SPSS 10.0). Criterion for inclusion in the factor structure was a factor loading value of ≥.35. Values have been rescaled.

[a]This item did not load on any factor.

consisted of one item each. The items were sense of punishment, crying, and irritability. The only item that did not significantly load on any factor was Item 19, weight loss.

Principal component analysis for the nonclinical females revealed a five-component model. However, examination of the scree plot (Figure 3) suggested that the structure of BDI items could best be explained by four factors. Table 33 shows the results of varimax rotation. Although distinct factors do appear, there was some overlap among factors. One of the items from the first factor (indecisiveness) also loaded on the second factor. Three other items from the first factor also loaded on the third or fourth factors (mood, sense of failure, guilt feelings). The first factor, accounting for 16% of the total variance, consisted of eleven items (1-5, 7, 9, 12-15): mood, pessimism, sense of failure, lack of satisfaction, guilt feelings, self-dislike, suicidal wishes, social withdrawal, indecisiveness, distortion of body image, and work inhibition. The second factor, accounting for 12% of the variance, consisted of six items (13, 16-18, 20-21): indecisiveness, sleep disturbance, fatigability, loss of appetite, somatic preoccupation, and loss of libido. The third factor, accounting for 9% of the variance, consisted of only two items (1, 6): mood and sense of punishment. Finally, the fourth factor, accounting for another 9% of the variance, consisted of five items (1, 3, 5, 8, 10): mood, sense of

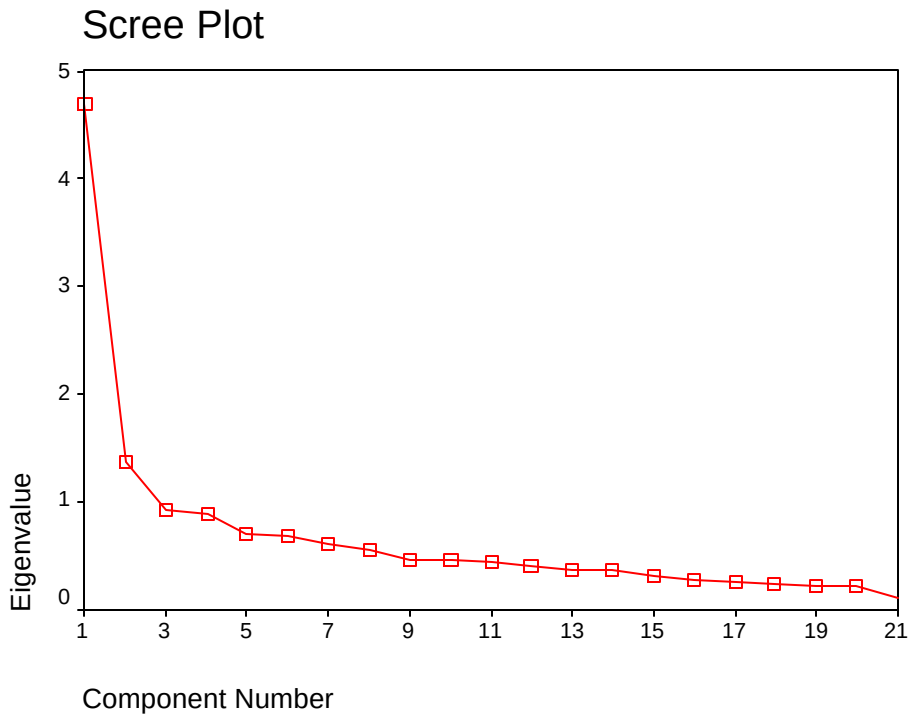

Figure 3: Scree plot of the principle component analysis for the nonclinical female sample.

failure, guilt feelings, self-accusation, and crying. Items 19 and 11, weight loss and irritability, did not load significantly on any of these factors. This model is similar to that for the combined group, with the first factor consisting mostly of cognitive/affective symptoms, and the second factor consisting mainly of somatic symptoms. A difference is that for the nonclinical females, items reflecting performance difficulties and body image preoccupation loaded highly on the Cognitive/Affective factor, whereas for the nonclinical combined group, these items loaded highly on the Somatic factor.

Table 33

Rotated Component Matrix for the Nonclinical Female Respondents

BDI Items	Components			
	1	2	3	4
(Bdi14) distortion of body image	.805			
(Bdi4) lack of satisfaction	.550			
(Bdi2) pessimism	.529			
(Bdi13) indecisiveness	.508	.496		
(Bdi3) sense of failure	.482			.385
(Bdi9) suicidal wishes	.482			
(Bdi5) guilt feelings	.478			.405
(Bdi7) self-dislike	.460			
(Bdi15) work inhibition	.460			
(Bdi1) mood	.459		.368	.368
(Bdi12) social withdrawal	.388			
(Bdi21) loss of libido		.740		
(Bdi16) sleep disturbance		.649		
(Bdi20) somatic preoccupation		.606		
(Bdi17) fatigability		.411		
(Bdi18) loss of appetite		.409		
(Bdi6) sense of punishment			.913	
(Bdi19) weight loss[a]				
(Bdi10) crying				.921
(Bdi8) self-accusation				.440
(Bdi11) irritability[a]				

Note. The matrix is based on results of Varimax Rotation using a Principle Component Analysis extraction method (SPSS 10.0). Criterion for inclusion in the factor structure was a factor loading value of ≥.35. Values have been rescaled.

[a]These items did not significantly load on any of the above factors.

Principal component analysis was conducted for the nonclinical males, resulting in a six-component model. However, observation of the scree plot (Figure 4) suggested that only the first four components were unique from the rest of the components. Therefore, these four factors were maintained. Results of the varimax rotation are presented in Table 34. The first factor, accounting for 14% of the total variance, consisted of ten items (1-5, 7, 9, 12, 19, 20): mood, pessimism, sense of failure, lack of satisfaction, guilt feelings, self-dislike, suicidal wishes, social withdrawal, weight loss, and somatic preoccupation. The second factor, accounting for 12% of the total variance, consisted of 7 items (3, 5, 7, 8, 13-15): sense of failure, guilt feelings, self-dislike, self-accusation, indecisiveness, distortion of body image, and work inhibition. The third factor, accounting for 10% of the total variance, consisted of six items (13, 15-18, 21): indecisiveness, work inhibition, sleep disturbance, fatigability, loss of appetite, and loss of libido. Finally, the fourth factor, accounting for 6% of the total variance, included just three items (6, 14, 17): sense of punishment, distortion of body image, and fatigability. Two items, crying and irritability, did not load significantly on any factor.

There was some difficulty in interpreting the factors for the male respondents. The factors for the nonclinical males appeared to be more heterogeneous than those

found for the nonclinical females. Also, there was a substantial amount of overlap of the items among the factors. Factor one consisted of mainly cognitive/affective items of various types. Factor two appeared to be more specific, consisting of mostly cognitive/affective items that reflected self-denigration. The third factor consisted of mainly items reflecting somatic concerns. Finally, the fourth factor, consisting of only three items, was difficult to interpret.

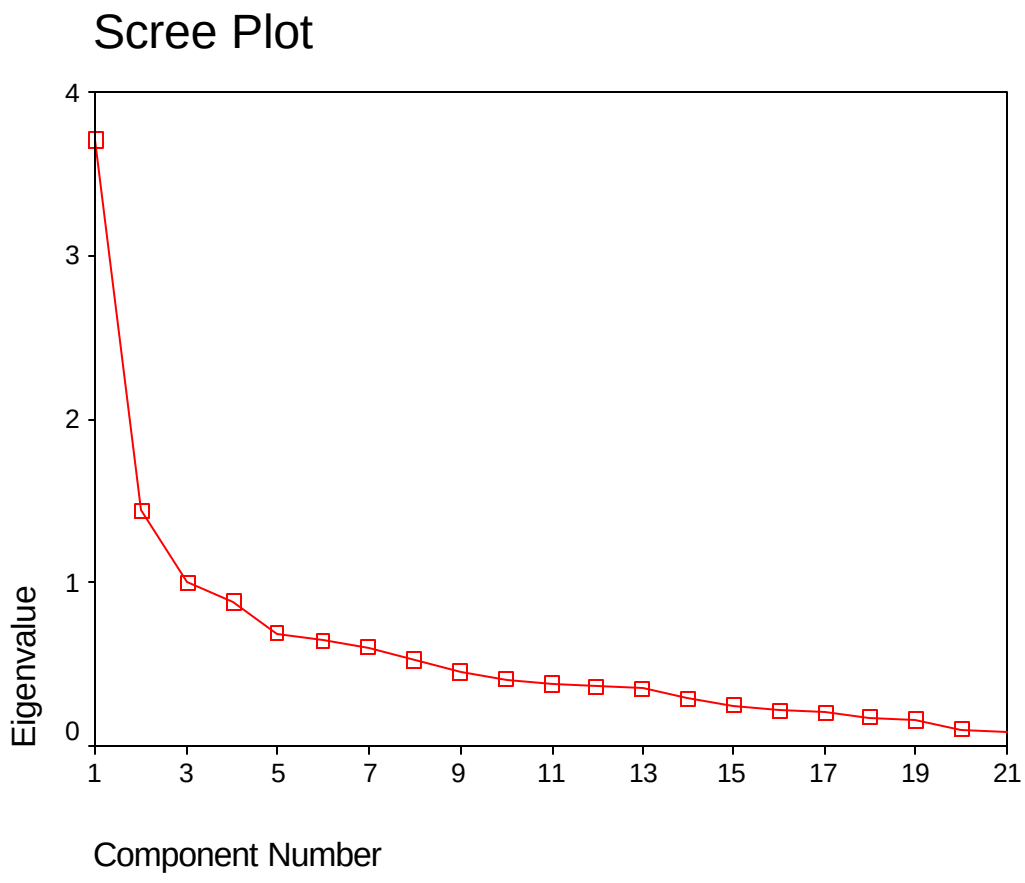

Figure 4: Scree plot of principal component analysis for the nonclinical male sample.

Table 34

Rotated Component Matrix for the Nonclinical Male Respondents

BDI Items	Components			
	1	2	3	4
(Bdi2) pessimism	.712			
(Bdi3) sense of failure	.589	.477		
(Bdi1) mood	.586			
(Bdi20) somatic preoccupation	.582			
(Bdi4) lack of satisfaction	.563			
(Bdi9) suicidal wishes	.427			
(Bdi12) social withdrawal	.406			
(Bdi19) weight loss	.389			
(Bdi8) self-accusation		.780		
(Bdi13) indecisiveness		.721	.467	
(Bdi5) guilt feelings	.429	.488		
(Bdi15) work inhibition		.457	.374	
(Bdi7) self-dislike	.432	.452		
(Bdi14) distortion of body image		.385		.354
(Bdi16) sleep disturbance			.662	
(Bdi17) fatigability			.572	.386
(Bdi21) loss of libido			.427	
(Bdi18) loss of appetite			.412	
(Bdi6) sense of punishment				.915
(Bdi11) irritability[a]				
(Bdi10) crying[a]				

Note. The matrix is based on results of Varimax Rotation using a Principle Component Analysis extraction method (SPSS 10.0). Criterion for inclusion in the factor structure was a factor loading value of ≥.35. Values have been rescaled.

[a]These items did not significantly load on any of the above factors.

Cronbach coefficient alphas were calculated for the major factors discussed above. For the nonclinical combined group, the first factor showed adequate internal consistency ($r_? = .83$) while the second factor showed slightly less consistency ($r_? = .77$). Reliability analysis for the nonclinical females and males showed similar results, with higher internal consistency for the first factor ($r_? = .86$ and $r_? = .82$, respectively) than for the second ($r_? = .74$ and $r_? = .73$, respectively).

Cross-Regional Comparisons

For exploratory purposes, the means of BDI scores for male and female university students in Boa Vista were compared with those of São Paulo and Port Alegre (Gorenstein, Pompéia, & Andrade, 1995; Cunha, Prieb, Touginha, & Goulart, 1996, respectively). Comparison with a sample from Rio de Janeiro was not done because BDI means were not reported in the study (Ferreira, 1995). T tests were used for comparing means. The alpha level was set at .01 to control for type I error. The São Paulo sample consisted of 80% undergraduate students and 20% graduate students from various universities, with a mean age of 23.1 (SD = 6.9). The Porto Alegre sample consisted of a random sample of students from PUCRS, distributed proportionally across curriculum

Table 35

Comparing BDI Score Means for College Students Across Three Brazilian Studies

Study Location	Females	Males
Boa Vista	M = 11.9*	M = 8.1
	SD = 8.2	SD = 5.6
	N = 76	N = 45
São Paulo[a]	M = 9.7	M = 7.1
	SD = 7.8	SD = 5.1
	N = 150	N = 120
Porto Alegre[b]	M = 7.0*	M = 5.9
	SD = 5.8	SD = 5.8
	N = 695	N 658

Note: The two means with an asterisk differ significantly, $t(771) = 6.68$, $p < .01$.

[a]Gorenstein, Pompéia, & Andrade, 1995.

[b]Cunha, Prieb, Touginha, & Goulart, 1996.

levels (from 1st to 8th), with a mean age of 22.9 (SD = 5.29). By comparison, the Boa Vista sample consisted of all undergraduate students, with a mean age of 28.7 (SD = 7.5).

The means across study and gender are presented in Table 35. No significant differences were found between students in the Boa Vista study and students in São Paulo. A significant difference was found, however, with the Porto Alegre study. Female students from Boa Vista had higher BDI scores than female students in Porto alegre.

CHAPTER V

DISCUSSION

Summary of Results

The purpose of the present study was to explore various properties of the Beck Depression Inventory (BDI) when applied to clinical and nonclinical populations of northern Brazil. Objectives of the study included adding to existing psychometric data on the BDI in Brazil, examining possible relationships between various demographic variables and the BDI, and assessing the BDI's ability to discriminate between clinically depressed and non-clinically depressed individuals. To address these objectives, a series of analyses were performed both to test specific hypotheses and to provide additional information in an exploratory fashion. In this section, there will be a summary of these results and a brief discussion on each. Following this will be a discussion on the limitations of the present study, and finally recommendations for future research in this area.

Part of the purpose of the present study was to see if the BDI would show certain psychometric properties consistent with a valid measure of depression. Consistent with this purpose, it was expected that the BDI would be internally reliable when used with this Brazilian population (hypothesis 1). Results supported this hypothesis. Cronbach coefficient alphas of the BDI items for the clinical sample and for each of the nonclinical samples did show evidence of internal reliability, with values ranging from .84 to .91.

These values are beyond the .70 cutoff rate suggested by Kaplan and Saccuzzo (1993). They also are consistent with other BDI research where alpha coefficient averages have generally been reported to be .75 or higher (Richter, Werner, Heerlein, Kraus, & Sauer, 1998). In the present study, the clinical sample received a coefficient value of .90, while the average of the coefficients for the nonclinical samples was .87. This is consistent with a study cited by Richter and colleagues that found coefficient averages to be slightly higher in psychiatric samples than in non-psychiatric samples (.88 and .82, respectively).

Four hypotheses in the present study dealt with proposed relationships between BDI scores and certain demographic variables. To test these hypotheses, a series of analyses of variance (ANOVAs) were run to test for BDI score differences across demographic categories and levels. These were followed by both a correlation analysis among the variables and a regression analysis using a General Linear Model (GLM) procedure to test for unique variance among the demographic variables in accounting for BDI scores.

The hypothesis that females would have higher BDI scores than males in the nonclinical population (hypothesis 2) was supported by both the ANOVA and regression results. ANOVA results showed that female nonclinical respondents had significantly higher BDI scores than their male counterparts. Results of regression analysis revealed that gender consistently accounted for a significant portion of the variance in BDI scores when used in combination with other demographic variables. In addition, for the two final regression models, gender accounted for more of the unique variance in BDI scores

than any other variable in the model. These results are consistent with the literature on gender and depression that has shown that in most societies studied, women report experiencing more depression than men (see review by Weissman, Bland, Joyce, & Newman, 1993). The results are also consistent with previous studies in Brazil that found that female college students had higher BDI scores than male college students (Gorenstein, Pompéia, & Andrade, 1995; Cunha, Prieb, Goulart, & Lemes, 1996). However, this gender difference in BDI scores does not appear to be universal, as studies in the United States and in The Netherlands have failed to find significant gender differences in BDI scores for college populations (Santor, Ramsay, & Zuroff, 1994; Baron & Matsuyama, 1987; Bryson & Pilon, 1984; Robbins & Tanck, 1984; Hammen & Padesky, 1977; Bosscher, Koning, & Van Meurs, 1986). A possible explanation for this discrepancy is that lower economic conditions may be related to larger differences between the sexes in terms of depressive symptoms. Given this assumption, as Brazil is still considered a developing country, then one would more likely expect gender differences in BDI scores in Brazil than in developed nations such as the U.S. Although the respondents in Brazilian BDI studies tend to be well educated, they still may have considerably less access to economic resources than their American or Western European counterparts. More economic hardship, in turn, may adversely affect women more than men. An alternative explanation is that there is some cultural aspect of Brazilian society that tends to promote a greater gender difference in the expression of depressive symptoms.

The hypothesis that nonclinical respondents with lower levels of socioeconomic status-related variables (SES) would have higher BDI scores than nonclinical respondents with higher levels of these variables (3) was supported by the results of ANOVA and correlation analysis. Results of correlation analysis showed that those with a higher education, a higher occupational status, and more household income had lower BDI scores. However, ANOVA results suggested that the main effect of these variables on BDI scores was found mostly between those in the lowest extremes of these variables and those in the higher levels. Specifically, those in the lowest level of occupational status and education had significantly higher BDI scores than those in the middle or high level; those in the lowest level of SES, as defined by an index that combined education and occupational status, had significantly higher BDI scores than those in the middle or high level; and those in the lowest level of income had significantly higher BDI scores than those in the highest level. This is consistent with the idea that economic hardship can adversely affect emotional health and that such hardship is found at the lowest socioeconomic levels.

Results of the regression analysis suggested that, although income and occupational status were related to BDI scores, education level could most likely account for this relationship. Education was found to account for a significant amount of the variance in BDI scores in both of the final regression models, while neither occupational status nor household income remained in the models. These results are consistent with previous research that has shown a robust relationship between education and depression across cultures. A possible explanation for the importance of this variable is that through

formal education, one is likely to significantly increase one's knowledge base and skills, and to think more flexibly. As a result, one can more adequately cope with life's demands. As education level tends to be highly related to other aspects of SES (i.e. income and occupational status), it is possible that the effect of education on depressive symptomatology may explain, in many cases, the relationship that is sometimes seen between income or occupational status and measures of depression.

The hypothesis that nonclinical adolescents would have higher BDI scores than nonclinical adults (hypothesis 4) was partially supported in this study. ANOVA results revealed that adolescents had significantly higher BDI scores than adult respondents in every age category but the 19- to 22-year-old group. No significance differences were found between the adult age groups. When included in a regression model, age status (i.e. adolescent vs. adult) accounted for a significant amount of unique variance in BDI scores when used in combination with gender, education, and the interaction between gender and age status. The finding that adolescents had higher scores than adults is consistent with most BDI studies in the U.S (see review by Richter et al. 1998). By contrast, one previous study in Brazil comparing an "adolescent" group to an "adult" group found that the "adolescent" group had significantly lower BDI scores (Cunha, Prieb, Touginha, & Goulart, 1996). However, in that study, "adolescents" were solely composed of university students whose age range went up to 21. In the present study, adolescents were defined as being under the age of 19 and, therefore, more effectively separated adolescents from young adults. The adolescents and adults in the present study also represented both university and non-university students. Regarding the interaction in this model, an

observation of the BDI means across gender for adolescents and for adults seemed to suggest that the gender difference in BDI scores was greater in the adolescents than in the adults. However, the extremely small effect size of this interaction ($?^2$ = .015) suggests that its contribution toward predicting BDI scores may have almost no practical significance.

The hypothesis that those who identified themselves as "indigenous" would have higher BDI scores than those who identified themselves as "non-indigenous" (hypothesis 5) was not supported in this study. Using ANOVA, there was no significant difference found between the groups. Interestedly, the mean difference between the "indigenous" and "non-indigenous" respondents was in the opposite direction of what was expected. This was unexpected given that, as an ethnic minority, indigenous people in Brazil are likely to have less access to various important resources (e.g. healthcare, education, adequate housing), to be more likely to experience discrimination, and to be more likely to suffer from stress associated with adapting to cultural differences. Such conditions are often seen as risk factors for depression. To understand why the "indigenous" group did not have higher BDI scores in the present study, it is important to know how the variable was measured. Ethnicity in this study was defined by how a person answered the question: "Do you identify yourself as 'indigenous' or 'non-indigenous?'" To help explain the unexpected finding, a couple of this researcher's collaborators suggested that the term "indigenous" may carry a negative connotation for many Brazilians, especially for those with less formal education. Therefore, many may have denied their ethnic heritage out of shame. Those who reported identifying themselves as indigenous, on the

other hand, may have had a relatively strong ethnic identity that could have offset any of the hardships discussed above for minority group members. Another possible explanation for no difference found was that the indigenous people may have a unique world-view, one that defines depressive symptoms differently than mainstream society (A.M. Lemos, Personal Communication, December, 1999).

An analysis of covariance (ANCOVA) was used to test for BDI mean differences between nonclinical adult respondents and adult respondents who were diagnosed with clinical depression (hypothesis 6). The analysis statistically controlled for the effects of education level and age. As expected, the clinical sample had significantly higher BDI scores than the nonclinical sample. In addition, the interaction between education level and clinical status was significant. Observation of the means suggested that although BDI scores increased with lower education level in the nonclinical sample, the scores decreased with lower education level in the clinical sample. Although past research has shown that there is an inverse relationship between amount of education and degree of depression in nonclinical samples, it is unclear what relationship there is for those with more severe levels of depression. It may be that with clinical depression, other factors beside SES become more prominent in determining the degree of symptom expression. In conclusion, the results show evidence of criterion validity. The BDI was able to differentiate between those with clinical depression and those without, even when demographic variables were taken into account.

For exploratory purposes, a factor analyses was run using principle component analysis and subsequent varimax rotation. Factor analysis was used to examine the

underlying dimensionality of the BDI items within this population. Such assessment can help in understanding the nature of symptom expression within a population, as well as help in revising an instrument for adaptation or for developing a new version. It was found that for the nonclinical females and for the nonclinical males and females combined, two main factors appeared, one of cognitive-affective items and the other of somatic items. A difference in factor structure between these two groups was that for females alone, items reflecting performance difficulties and body image preoccupation loaded highly on the Cognitive/Affective factor, whereas for the combined group, these items loaded more highly on the Somatic factor. For the male nonclinical respondents, two main factors resulted that each included items reflecting cognitive-affective symptoms, with the second factor being more specific to thoughts of self-denigration. A third factor was also interpreted for the males, consisting of items of somatic concern. Therefore, for the males, there appeared to be a differentiation between cognitive-affective items and somatic items within the factor structure of the scale, although it did not fit the two-factor structure that was found with the female respondents. The major factors for the male, female, and combined samples all showed adequate to good internal consistency (from $r_{?} = .73$ to $r_{?} = .86$).

The finding that there were two main factors, one mostly of cognitive-affective items and one mostly of somatic items was consistent with other studies in Brazil (Gorenstein, Andrade, Filho, Tung, & Artes, 1999; Gorenstein & Andrade, 1998), as well as for studies in Argentina (Bonicatto, Dew, & Soria, 1998). However, in the present study, this two-factor structure was only found for the female respondents and the male

and female respondents combined. For the male respondents, the factor structure was more complex. However, different factor structures across gender are not necessarily unexpected as at least one study found that men and women showed different patterns of symptom expression on the BDI (Hammen & Padesky, 1977).

Another exploratory analysis was conducted to compare the BDI mean score of the university students in this study with BDI means of university students taken from two previous studies carried out in two southern cities of Brazil: São Paulo and Porto Alegre. One purpose was to see if there would be differences found between university students from a northern region of Brazil and university students from southern regions of Brazil. No significant differences were found between university students from Boa Vista and university students from São Paulo on BDI scores; however, a significant difference was found between students from Boa Vista and those from Porto Alegre. Boa Vista female students had higher BDI scores than female students in Porto Alegre. Finding explanations for this difference is complex. For one, the Porto Alegre sample was somewhat younger than the sample from Boa Vista and, unlike the Boa Vista sample, included graduate students as well as undergraduate students. There also may have been other demographic characteristics not accounted for that may be related to BDI outcomes. In addition, the Porto Alegre study took place over three years before the present study. Therefore, not only are differences in regions being tested, but also differences in history. As economic conditions have reportedly been gradually worsening over recent years, it is possible that economics changes over time could account for the higher BDI scores.

Limitations of the Present Study

There were several limitations of the present. At least two limitations have to do with the samples used in this study. The participants recruited were not drawn from the population randomly. Random selection of participants can be important in minimizes the chances that samples are highly unrepresentative of the general population. Further, respondents were only recruited from areas in the city of Boa Vista. Therefore, results of this study may not necessarily apply to those in other areas of northern Brazil, particularly in rural areas. Also, most of the participants were students of formal education. For these three reasons, generalizability of the results beyond the samples studied cannot easily be assumed.

In order to provide a range on each of the demographic variables to be studied so that adequate analysis could be conducted, participants were gathered from various locations that were expected to differ on these variables. The analyses were then based on data from a combination of all the locations. A potential source of problems in interpreting the research results is that each location represented an intact group. Although to a certain degree one can account for certain potential confounding variables when using intact groups, it is virtually impossible to account for all the shared characteristics that are unique to each group. For the present study, the intact groups included university students, CEFAM students, technical school students, and night school students. These groups differed from each other in terms of all the variables being studied. Thus, any difference in BDI scores found across age or SES levels may actually have been partly due to some "hidden" variable(s) that differed across sample groups.

The extreme example is with education level which was, for the most part, defined by sample group. Thus, when it was shown that the BDI scores related to the variable "education," it was not exactly clear whether the relationship was between BDI scores and the amount of education or between BDI scores and some other characteristic that defined group membership. Unfortunately, there was no statistical way to account for this.

There were limitations in the study concerning the clinically depressed sample. Certain types of information could not be gathered on the clinical respondents due to a relatively small sample size. For example, factor analysis could not be effectively run for the clinical sample because the number of respondents fell below the recommended minimum level for performing such an analysis. Also, the comparison between clinical and nonclinical samples could only be done with adults, as adolescents were not adequately represented in the clinical sample. Another criticism of the clinical sample is that it included individuals who had their first contact with treatment over 72 hours prior to the time they had completed their materials. One concern is that people being treated for depression are likely to experience an amelioration of their symptoms and, therefore, a comparison of "clinically-depressed" vs. "nonclinically-depressed" would be compromised by attenuated differences due to iatrogenic effects. However, preliminary analysis in the present study revealed that there was no significant difference in BDI scores between clinical respondents who had just begun treatment and those who had been in treatment longer.

Missing data became an issue in the present study. A substantial number of cases had missing data on either BDI items or on demographic variables. This, therefore, was of concern when performing the analyses. If the pattern of missing data across variables being studied is not random, then there is a possibility of hidden biases, especially if the researcher chooses to remove cases to solve the problem. Imputation of values for missing data can be used to lessen this bias effect and prevent shrinkage in sample size. However, imputation can also add additional problems, such as artificially decreasing variance among items, as is the case with imputation of averages, or artificially reinforcing relationships, as is the case with regression-derived imputation values. Regarding the BDI missing data, a balance was made in the present study. Cases were maintained for analysis if they had no more than five missing items. A minimum amount of cases were excluded to prevent a substantial amount of shrinkage in sample size and to prevent having a sample left over that was less representative of the population. Averages were imputed for BDI missing data for the ones who remained. Unfortunately, imputation could not be done for many of the demographic variables studied, as most variables were measured on an ordinal or nominal scale of two or three levels. Cases with missing data on these variables were excluded when these variables were included in analysis. As a result, for some of the analyses, sample size differed depending on which variables were being examined. For the regression analyses, the sample size was kept the same for comparing models; however, the risk remained of having a sample that may be less representative of the population.

Conclusion and Recommendations for Future Research

The present study found important information regarding the use of the BDI in northern Brazil. The finding of adequate internal consistency and the ability of the scale to discriminate between clinically depressed and nonclinically depressed individuals is a starting point for establishing the validity of the BDI for use in the population of this region. Relationships were also found between demographic variables and the BDI. Also, the factor structure of the scale was explored. This information may be important for both interpreting scores in clinical work as well as helping shed light on the nature of depression in this region, as well as elsewhere.

It is hoped that this study will stimulate future research in this area. Recommendations are that the BDI be examined using a larger and more representative sample of the population in order to see if the results in the present study can be replicated. This can be done through random and stratified selection techniques, as well as through recruiting from both urban and rural areas. In addition, it is recommended that studies continue in the validation process of the scale. This should involve comparing the BDI to other measures of depression and to measures of other constructs so that both divergent and convergent validity can be established. Also, individuals diagnosed with clinical depression should be compared with individuals diagnosed with other psychiatric conditions to give a more stringent test of the scale's discriminant ability. It would also be interesting to conduct a more comprehensive cross-regional comparison of BDI scores by collecting data from different regions of Brazil in the same study. If the groups are

appropriately matched, this may help elucidate possible relationships between the BDI and cultural factors within Brazil.

APPENDIX A

TABLES OF REGRESSION ANALYSIS

Appendix A

Table 16

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 1 (N = 317)

Variable	df	F	? 2
Gender (G)	1	.31	.001
Education (E)	2	3.37*	.022
Age (A)	1	5.50*	.018
G x E	2	.70	.005
G x A	1	.10	.000
E x A	2	1.53	.010
G x E x A	2	.76	.005
Error	305		

Note. R^2 = .133 (Adjusted R^2 = .102)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 17

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 2 (N = 317)

Variable	df	F	? 2
Gender (G)	1	.31	.001
Education (E)	2	3.37*	.022
Age (A)	1	5.50*	.018
G x E	2	.70	.005
E x A	2	1.53	.010
G x E x A	3	.801	.008
Error	305		

Note. R^2 = .133 (Adjusted R^2 = .102)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 18

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 3 (N = 317)

Variable	df	F	? 2
Education (E)	2	3.37*	.022
Age (A)	1	5.50*	.018
G x E	3	.51	.005
E x A	2	1.53	.010
G x E x A	3	.801	.008
Error	305		

Note. R^2 = .133 (Adjusted R^2 = .102)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 19

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 4 (N = 317)

Variable	df	F	? 2
Education (E)	2	5.04**	.032
Age (A)	1	9.03**	.028
E x A	2	3.08*	.020
G x E x A	3	6.59***	.060
Error	308		

Note. R^2 = .129 (Adjusted R^2 = .106)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 20

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 5 (N = 317)

Variable	df	F	? ^{2}
Education (E)	2	5.04**	.032
Age (A)	1	9.03**	.028
G x E x A	5	4.99***	.075
Error	308		

Note. R^2 = .129 (Adjusted R^2 = .106)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 21

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 6 (N = 317)

Variable	df	F	? 2
Gender (G)	1	12.78	.040
Education (E)	2	5.08	.032
Age (A)	1	6.94	.022
G x E	2	.14	.001
E x A	2	2.90	.018
Error	305		

Note. R^2 = .126 (Adjusted R^2 = .103)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 22

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 7 (N = 317)

Variable	df	F	? 2
Gender (G)	1	18.65***	.057
Education (E)	2	5.20**	.032
Age (A)	1	7.22**	.023
E x A	2	3.00	.019
Error	310		

Note. R^2 = .125 (Adjusted R^2 = .108)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 23

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Covariate: Model 8 (N = 317)

Variable	df	F	? 2
Gender (G)	1	17.63***	.053
Education (E)	2	6.72**	.041
Age (A)	1	4.28*	.014
Error	312		

Note. R^2 = .108 (Adjusted R^2 = .097)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 24

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Dichotomous Variable: Model 1 (N = 317)

Variable	df	F	? 2
Gender (G)	1	6.34*	.020
Education (E)	2	4.08*	.026
Adolescent vs. Adult (AD)	1	2.10	.007
G x E	2	.265	.002
G x AD	1	2.60	.008
E x AD	2	.146	.001
G x E x AD	2	.137	.001
Error	305		

Note. R^2 = .146 (Adjusted R^2 = .115)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 25

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Dichotomous Variable: Model 2 (N = 317)

Variable	df	F	? 2
Gender (G)	1	17.83***	.055
Education (E)	2	4.06*	.026
Adolescent vs. Adult (AD)	1	3.15	.010
G x E	2	1.57	.010
G x AD	1	6.39*	.020
E x AD	2	.071	.000
Error	307		

Note. R^2 = .145 (Adjusted R^2 = .120)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix A

Table 26

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Dichotomous Variable: Model 3 (N = 317)

Variable	df	F	? 2
Gender (G)	1	18.98***	.058
Education (E)	2	5.56**	.035
Adolescent vs. Adult (AD)	1	6.76*	.021
G x E	2	1.79	.011
G x AD	1	7.58**	.024
Error	309		

Note. R^2 = .145 (Adjusted R^2 = .125)

* $p < .05$ ** $p < .01$ *** $p < .001$

Appendix

Table 27

Summary of Regression Analysis (GLM) for Variables and Interactions Predicting BDI Scores Using Age as a Dichotomous Variable: Model 4 (N = 317)

Variable	df	F	? 2
Gender (G)	1	22.45***	.067
Education (E)	2	5.52**	.034
Adolescent vs. Adult (AD)	1	7.19**	.023
G x AD	1	4.71*	.015
Error	311		

Note. R^2 = .135 (Adjusted R^2 = .121)

* $p < .05$ ** $p < .01$ *** $p < .001$

APPENDIX B

MEASUREMENT TOOLS

Inventário Beck

Neste questionário existem grupos de afirmativas. Por favor, leia cuidadosamente cada uma delas. A seguir, selecione a afirmativa, em cada grupo, que melhor descreve como você se sentiu NA SEMANA QUE PASSOU, INCLUINDO O DIA DE HOJE. Desenhe um círculo em torno do número ao lado da afirmativa que houver selecionado. Se várias afirmativas no grupo paracerem aplicar-se igualmente bem, circule cada uma delas. Certifique-se de ler todas as afirmativas de cada grupo antes de fazer sua escolha.

1 0 Não me sinto triste. 1 Sinto-me triste. 2 Sinto-me triste o tempo todo e não consigo sair disso. 3 Estou tão triste ou infeliz que não posso agüentar!	5 0 Não me sinto particularmente culpado(a). 1 Sinto-me culpado(a) boa parte do tempo. 2 Sinto-me muito culpado(a) a maior parte do tempo. 3 Sinto-me culpado(a) o tempo todo.
2 0 Não estou particularmente desencorajado(a) quanto ao futuro. 1 Sinto-me desencorajado(a) quanto ao futuro. 2 Sinto que não tenho nada por esperar. 3 Sinto que o futuro é sem esperança e que as coisas não podem melhorar.	6 0 Não sinto que esteja sendo punido(a). 1 Sinto que posso ser punido(a). 2 Espero ser punido(a). 3 Sinto que estou sendo punido(a).
3 0 Não me sinto fracassado(a). 1 Sinto que falhei mais do que o indivíduo médio. 2 Quando olho para trás em minha vida, tudo que vejo é uma porção de fracassos. 3 Sinto que sou um fracasso completo.	7 0 Não me sinto desapontado(a) comigo mesmo(a). 1 Sinto-me desapontado(a) comigo mesmo(a). 2 Me aborrecido(a) comigo mesmo(a). 3 Eu me odeio.
4 0 Obtenho tanta satisfação com as coisas como costumava fazer. 1 Não gosto das coisas da maneira que costumava gostar. 2 Não consigo mais sentir satisfação real com coisa alguma. 3 Estou insatisfeito(a) ou entediado(a) com tudo.	8 0 Não sinto que sejo pior que qualquer outra pessoa. 1 Critico-me por minhas fraquezas ou erros. 2 Responsabilizo-me o tempo todo por minhas falhas. 3 Culpo-me por todas as coisas ruins que acontecem.
	9 0 Não tenho nenhum pensamento a respeito de me matar. 1 Tenho pensamentos sobre me matar, mas não os levaria adiante. 2 Gostaria de me matar. 3 Eu me mataria, se tivesse uma oportunidade.

10	0 Não costumo chorar mais que o habitual. 1 Choro mais agora do que costumava fazer. 2 Atualmente, choro o tempo todo. 3 Eu costumava conseguir chorar, mas agora não consigo, ainda que queria.	15	0 Posso trabalhar mais ou menos tão bem quanto antes. 1 Preciso de um esforço extra para começar qualquer coisa. 2 Tenho que me forçar muito até fazer qualquer coisa. 3 Não consigo fazer nenhum trabalho.
11	0 Não me irrito mais agora que em qualquer época. 1 Fico molestado(a) ou irrritado(a) mais facilmente do que costumava. 2 Atualmente, sinto-me irritado(a) todo o tempo. 3 Absolutamente não me irrito com as coisas que costumava irritar-me.	16	0 Durmo tão bem quanto de hábito. 1 Não durmo tão bem quanto costumava. 2 Acordo 1 ou 2 horas mais cedo que de hábito e tenho dificuldades de voltar a dormir. 3 Acordo várias horas mais cedo do que costumava e não consigo voltar a dormi
12	0 Não perdi o interesse nas outras pessoas. 1 Interesso-me menos do que costumava pelas outras pessoas. 2 Perdi a maior parte do meu interesse nas outras pessoas. 3 Perdi todo o meu interesse nas outras pessoas.	17	0 Não fico mais cansado(a) do que de hábito. 1 Fico cansado(a) com mais facilidade do que costumava. 2 Sinto-me cansado(a) ao fazer qualquer coisa. 3 Estou cansado(a) demais para fazer qualquer coisa.
13	0 Tomo decisões mais ou menos tão bem quanto em qualquer outra época. 1 Adio minhas decisões mais do que costumava. 2 Tenho maior dificuldade em tomar decisões do que antes. 3 Não consigo mais tomar decisão alguma.	18	0 Meu apetite não está pior do que de hábito. 1 Meu apetite não é tão bom quanto costumava ser. 2 Meu apetite está muito pior agora. 3 Não tenho mais nenhum apetite.
14	0 Não sinto que minha aparência seja pior do que costumava ser. 1 Preocupo-me por estar parecendo velho(a) ou sem atrativos. 2 Sinto que há mudanças permanentes em minha aparência que me fazem parecer sem atrativos. 3 Considero-me feio(a).	19	0 Não perdi muito peso se é que perdi algum ultimamente. 1 Perdi mais de 2,5 kg. 2 Perdi mais de 5 kg. 3 Perdi mais de 7,5 kg Estou deliberadamente tentando perder peso, comendo menos. Sim_____ Não_____

20 0 Não me preocupo mais que de hábito com minha saúde. 1 Preocupe-me com problemas físicas, com dores e aflições, ou perturbações no estômago, ou prisão de ventre. 2 Estou muito preocupado(a) com problemas físicos e é difícil pensar em muito mais que isso. 3 Estou tão preocupado(a) com meus problemas físicos que não consigo pensar emqualquer outra coisa.	21 0 Não tenho observado qualquer mudança recente em meu interesse sexual. 1 Estou menos interessado(a) em sexo do que costumava. 2 Estou bem menos interessado(a) em sexo atualmente. 3 Perdi completamente o interesse no sexo.

Translation from: Pinto, D. (1997). Uma analise lingüistica da adaptação brasileira do Inventario Beck de Depressão. Jornal Brasileiro de Psiquiatria, 46(5), 249-253.

Beck Depression Inventory (English Version)

This questionnaire consists of 21 groups of statements. After reading each group of statements carefully, circle the number (0, 1, 2, or 3) next to the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY. If several statements within a group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1. 0 I do not feel sad.
   1 I feel sad.
   2 I am sad all the time and I can't snap out of it.
   3 I am so sad or unhappy that I can't stand it.

2. 0 I am not particularly discouraged about the future.
   1 I feel discouraged about the future
   2 I feel I have nothing to look forward to.
   3 I feel I am a complete failure as a person.

3. 0 I do not feel like a failure.
   1 I feel I have failed more than the average person.
   2 As I look back on my life, all I can see is a lot of failures.
   3 I feel I am a complete failure as a person.

4. 0 I get as much satisfaction out of things as I used to.
   1 I don't enjoy things the way I used to.
   2 I don't get real satisfaction out of anything anymore.
   3 I am dissatisfied or bored with everything.

5. 0 I don't feel particularly guilty.
   1 I feel guilty a good part of the time.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6. 0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.

7. 0 I don't feel disappointed in myself.
   1 I am disappointed in myself.
   2 I am disgusted with myself.
   3 I hate myself.

8. 0 I don't feel I am any worse than anybody else.
   1 I am critical of myself for my weaknesses or mistakes.
   2 I blame myself all the time for my faults.
   3 I blame myself for everything bad that happens.

9. 0 I don't have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. 0 I don't cry anymore than usual.
    1 I cry more now than I used to.
    2 I cry all the time now.
    3 I used to be able to cry, but now I can't cry even though I want to.

11. 0 I am no more irritated now than I ever am.
    1 I get annoyed or irritated more easily than I used to.
    2 I feel irritated all the time now.
    3 I don't get irritated at all by the things that used to irritate me.

12. 0 I have not lost interest in other people.
    1 I am less interested in other people than I used to be.
    2 I have lost most of my interest in other people.
    3 I have lost all of my interest in other people.

13. 0 I make decision about as well as I ever could.
    1 I put off making decisions more than I used to.
    2 I have greater difficulty making decisions than before.
    3 I can't make decisions at all anymore.

14. 0 I don't feel I look any worse than I used to.
    1 I am worried that I am looking old or unattractive.
    2 I feel that there are permanent changes in my appearance that make me look unattractive.
    3 I believe that I look ugly.

15. 0 I can work about as well as before.
    1 It takes an extra effort to get started at doing something.
    2 I have to push myself very hard to do anything.
    3 I can't do any work at all.

16. 0 I can sleep as well as usual.
    1 I don't sleep as well as I used to.
    2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
    3 I wake up several hours earlier than I used to and cannot get back to sleep.

17. 0 I don't get more tired than usual.
    1 I get tired more easily than I used to.
    2 I get tired from doing almost anything.
    3 I am too tired to do anything.

18. 0 My appetite is no worse than usual.
    1 My appetite is not as good as it used to be.
    2 My appetite is much worse now.
    3 I have no appetite at all anymore.

19. 0 I haven't lost mu ch weight, if any, lately.
    1 I have lost more than 5 pounds.
    2 I have lost more than 10 pounds.
    3 I have lost more than 15 pounds

    I am purposely trying to lose weight by eating less.
    Yes_____ No_____

20. 0 I am no more worried about my health than usual.
    1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
    2 I am very worried about physical problems and it's hard to think of much else.
    3 I am so worried about my physical problems that I cannot think about anything else.

21. 0 I have not noticed any recent change in my interest in sex.
    1 I am less interested in sex than I used to be.
    2 I am much less interested in sex now.
    3 I have lost interest in sex completely.

From: Beck, A. T., Rush, A., Shaw, B., & Emery, G. T. (1979). Therapy of Depression. New York: Guilford Press.

(Demographic Questionnaire)
DADOS PESSOAIS

Por favor responda os seguintes itens marcando a opção correta com um X ou preenchendo os espaços em branco.

1. Idade: ___ anos

2. Sexo: ___ masculino ___ feminino

3. Estado civil: ___ solteiro ___ casado ___ viúvo ___ divorciado ___ separado

4. Moro com: ____ meu cônjuge ____ meus pais ___ sozinho ____outros (.....)

5. Quantos filhos você possui? _____ Quantos filhos moram com você? _____

6. Quantas pessoas moram na sua casa? _____

7. Você se considera indígena ou não-indígena?
___ indígena ___ não-indígena

8. Qual é sua ocupação atual? _____
A ocupação de seu pai? _____
A ocupação de sua mãe? _____
A ocupação de seu esposo(a)? _____
Qual é o seu salário mensal? _____ (...) Não trabalho (...) Estou desempregado

9. Marque a opção que corresponde à sua renda familiar:
_____ até 2 salários mínimos
_____ de 2 a 5 salários mínimos
_____ de 5 a 10 salários mínimos
_____ de 10 a 20 salários mínimos
_____ Mais de 20 salários mínimos
_____ Sem rendimento

10. A quanto tempo você mora em Boa Vista? _____ anos
E em Roraima? _____ anos
11. Se você não é natural dessa área, onde você morava antes?_____

12. Grau de instrução (marque o item correspondente ao nível que você completou):
____ Fundamental
____ Médio (.....)
____ Superior
No momento, você está cursando a _____série do nível _____

13. Você está tomando algum remédio controlado? ___ sim ___ não
Em caso afirmativo, qual?_____ para que serve?_____
Atualmente, você participa de algum programa de terapia para lhe ajudar com seus problemas emocionais?
___ sim ___ não
Que outro tipo de ajuda você recorre para lhe ajudar com seus problemas emocionais?
_____

DEMOGRAPHIC QUESTIONNAIRE (English Translation)

Please respond to the following items by either marking an option with an X, or by writing in the blanks.

1. Age: ___ years

2. Sex: ___ male ___ female

3. Marital Status: ___single ___married ___widowed ___divorced ___separated

4. Live with: ___my spouse ___my parents ___alone ___others (……..)

5. How many children do you have? _____ How many children live with you? _____

6. How many people live in your house? _____

7. Do you consider yourself indigenous or nonindigenous?
___ indigenous ___ nonindigenous

8. What is you current occupation? _____
Your father's occupation? _____
Your mother's occupation? _____
Your spouse's occupation? _____
What is your monthly salary? _____ (…) I do not work (…) I am unemployed

9. Mark the option that corresponds to your household income:
_____up to 2 minimum salaries
_____from 2 to 5 minimum salaries
_____from 5 to 10 minimum salaries
_____from 10 to 20 minimum salaries
_____more than 20 minimum salaries
_____no salaries

10. How long have you lived in Boa Vista? _____ years
In Roraima? _____ years
11. If you are not a native to this area, where was your previous residence? _____

12. How many years of formal education have you completed? _____ years
Level of Instruction (Mark the item that corresponds to the level that you completed):
___ primary school
___ secondary school
___ tertiary school
At the moment, I am studying at _____year of level _____.

13. Are you currently taking any prescription medication? ___ yes ___ no
If yes, which? _____ What is it for? _____
Are you currently participating in counseling for emotional difficulties? ___ yes ___ no
What other type of help are you receiving to help with emotional difficulties?

Classification of Occupation Status

(Pastore, 1982)

Social Strata and Sample Occupations from Brazil*

Social Stratum	Sample Occupations **
Upper	Industrialists, large farmers and ranchers, high banking administrators, doctors, lawyers, engineers
Upper-middle	Public service administrators, comptrollers, administrators, medium-sized landlords, business representatives
Middle-middle	Draftsmen, musicians, broadcasters, buyers, office workers, small landlords, construction foremen
Lower-middle	Electricians, masons, plumbers, carpenters, carpet sellers, drivers, barbers
Upper-lower	Urban manual workers, deliverymen, shoeshiners, janitors
Lower-lower	Rural manual workers, fishermen, rubberworkers

* Reprinted from Pastore, J. (1982). Inequality and social mobility in Brazil. Madison, Wi.: The University of Wisconsin Press.
** A full list of occupations is provided in the appendix of the above cited reference.

APPENDIX C

INFORMED CONSENT FORM

Validação do BDI no Norte do Brasil

Nós estamos solicitando sua participação num estudo de pesquisa sobre a utilidade de medidas de humor para uso no norte do Brasil. Tal pesquisa está sendo conduzida por um professor e um estudante de doutorado da University of North Texas, nos Estados Unidos, e por professores da Universidade Federal de Roraima, Brasil. Como parte do processo de validação do instrumento, sua participação será um importante passo para propocionar aos terapeutas brasileiros os meios efetivos para o diagnóstico dos distúrbios emocionais e para os planejamentos psicológicos e tratamentos psiquiátricos.

Você irá preencher dois questionários que, combinados, deverão levar uns 20 minutos. Um dos questionários é uma medida de humor que irá lhe perguntar sobre suas experiências emocionais nessa semana passada até hoje. O outro consiste de perguntas a respeito de aspectos de sua vida que podem estar relacionadas com o humor.

A informação obtida nesse estudo será usada somente para propósitos de pesquisa. Suas respostas serão confidenciais, posto que você não irá escrever o seu nome nas folhas dos questionários. Qualquer informação obtida nessa pesquisa pode ser usada para publicação ou educação. Não há nenhum risco ou desconforto diretamente ligado com essa pesquisa. Seu envolvimento nesse estudo é voluntário e você pode desistir a qualquer momento sem nenhum constragimento ou efeito negativo sobre suas notas ou status enquanto estudante.

Qualquer pergunta ou problema em relação à sua participação nesse estudo, por favor entre em contato conosco:

Christopher Albert	095-625-2878 (Brasil) (940) 484-2740 (E.U.A.)
Vincent Ramos	(940) 565-2671

Esse projeto foi revisado pelo Comitê para Proteção dos Sujeitos Humanos da University of North Texas (phone: 565-3940)

_____

Validation of the BDI in Northern Brazil

We are asking for your participation in a research study investigating the utility of a mood measure for use in northern Brazil. The research is being conducted by a professor and an advanced graduate student from the University of North Texas, U.S.A, and faculty members from the Universidade Federal de Roraima, Brazil. As part of the process of validating the instrument, your participation will be an important step in providing Brazilian clinicians with an effective tool for both diagnosing emotional disturbances as well as for planning psychological and psychiatric treatment.

You will be asked to fill out two questionnaires that, combined, should take about 15 minutes or less. One of the questionnaires is a mood measure that will ask you about your emotional experiences within the past week. The other consists of questions regarding aspects of your life that may be related to mood.

The data obtained in this study will be used for research purposes only. Your responses will be kept confidential as you will not be asked to provide your name on any questionnaire. Any information obtained from this research may be used for publication or education. There is no personal risk or discomfort directly involved with this research. Your involvement in this research is on a voluntary basis and you may withdraw at any time without penalty, prejudice, or negative effects upon your grades or standing as a student.

If you have any questions or problems that arise in connection with your participation in this study, you should contact:

Christopher Albert 095-625-2878 (Brasil)
(940) 484-2740 (E.U.A.)

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